JOURNAL OF THE

Malacological Society of Australia

No. 1

ODICAL

Published 13th September, 1957

THE MALACOLOGICAL SOCIETY OF AUSTRALIA

1957

Patrons:

PROF. R. TUCKER ABBOTT, Ph.D.

MISS JOYCE ALLAN, F.R.Z.S.

MR. BERNARD C. COTTON, F.R.Z.S.

President:

MR. DENZIL I. HARTLEY.

Hon. Secretary-Treasurer:

MRS. D. I. HARTLEY.

Committee Members:

MISS F. V. MURRAY

MR. W. BODE

MR. O. J. T. REID

MR. R. BURN

Published by The Malacological Society of Australia and obtainable from the Secretary, 351 Glenferrie Road, Malvern, Melbourne, Australia. The opinions of Authors are not necessarily those of The Malacological Society of Australia or the Editor.

INTRODUCTION

The birth of the Journal of The Malacological Society of Australia is a welcome and significant milestone in the already rich history of Australian malacology. The marine fauna surrounding the continent is probably the most diverse and richest in the world, and for nearly 200 years its molluscs have attracted the attention of many well-known malacologists.

One hundred and eighty-seven years ago Dr. David Solander, a student of Linne's, stepped off Captain Cook's *Endeavour* and scoured the shores of Botany Bay in New South Wales. During the next hundred years, exploring expeditions from nearly every major power took back molluscan treasures to European museums. Two American expeditions ventured into Australian waters, one of them the U.S. Exploring Expedition in 1839, the other in 1853, when William Stimpson was aboard the U.S.N. *Vincennes*, commanded by Capt. John Rodgers.

Soon. however, Australia was supporting her own malacologists, and the collecting and study of the local faunas was being pioneered by such famous men as George French Angas, John Brazier and James C. Cox. Australia had reached its malacological maturity with the coming of that great zoologist, Charles Hedley. Today, Australian names ring loud in the halls of international malacology—Iredale, Ashby, Tate, May, Gabriel, Verco, Cotton, Macpherson, to mention only a few.

American ties with Australia are very old and strong. The Academy of Natural Sciences of Philadelphia has received a steady flow of correspondence and specimens from its Australian members since its founding in 1812. Angas, Brazier and Cox were members of our Conchological Section. Many Australian land and fresh-water molluscs were described by Academy scientists, such as Isaac Lea and Timothy Conrad. It seems poetic justice that the first Secretary of The Malacological Society of Australia was, before her marriage to D. I. Hartley, an American citizen.

Your Society and new Journal are destined to serve well your great country and its many workers. The rest of the malacological world joins in wishing you the blessings of co-operation, the enjoyment of the years of labour ahead, and the satisfaction of scientific accomplishments.

R. TUCKER ABBOTT, Ph.D.,
Pilsbry Chair of Malacology.
Academy of Natural Sciences of Philadelphia.

25th June, 1957.

FOREWORD

For half a century enthusiastic Conchologists have met together as kindred spirits, in societies, sections, clubs or informal gatherings in most Australian States to discuss their mutual interest. It is these internationally famous pioneers, Charles Hedley, Tom Iredale, Joyce Allan, John Brazier, Charles Gabriel, William Lewis May, Julian Edmund Tenison-Woods, William Tomson Bednall, Sir Joseph Verco, mentioning just a few, to whom the Conchological world, and particularly Australia, is deeply indebted.

On the 23rd of October, 1953, a band of seven enthusiasts founded in Melbourne The Malacological Club of Victoria, which enjoyed four successful years, and has the honour of being the forerunner of the Malacological Society of Australia, which held its first Annual Meeting in December, 1956, an important milestone in Conchological history.

Most will agree that the achievement of this worthy end has been largely due to the wholehearted and untiring work of the foundation President and his wife, the Secretary-Treasurer, both of whom have spared neither time, nor effort, nor finance, to bring the organisation into being.

Gathered together into one Society, we have over one hundred members dispersed throughout Australia, with representatives in every State and in many overseas countries.

The stage is now set in Australia to analyze the work of the widely informed pioneers by adding the knowledge of specialists of the era and by interpreting the valuable contribution this centre of Molluscan life can furnish.

We are happily placed in that off the coast of our continent we have huge faunal areas of rich material. These comprise the Dampierian Province extending from Geraldton to Cape York, with its rich tropical, widely-dispersed fauna; the Banksian Province from Cape York to Gladstone, with its Pacific fauna; the Solanderian Province covering the largest coral reef in the world; then the most interesting and truly Australian Provinces of Southern Australia, the Eastern Peronian; the Tasmanian Maugean and the Southern Australian Flindersian extending down from Melbourne to Geraldton. These Southern Provinces have so many unique shells, survivals from the past, and new species to be discovered that probably more valuable work could be done here than in any part of the world.

It is to be expected that this new venture in publications, "The Journal of The Malacological Society of Australia," here introduced, will live to record many valuable and interesting accounts of our native molluscs, and it is hoped that its future pages may contain many field observations of the living animal, a branch of our study hitherto somewhat neglected.

In conclusion, it is the wish of all that, stimulated by the added interest offered in this new society, Australian Conchologists will be able to meet together regularly and to discuss their studies on an interesting basis.

BERNARD C. COTTON, F.R.Z.S.,
Curator of Molluscs,
South Australian Museum, Adelaide.

SOME OPISTHOBRANCHIA (CLASS GASTROPODA) NEW TO AUSTRALIA OR OTHERWISE OF INTEREST

By JOYCE ALLAN, F.R.Z.S.*

Following my usual practice when possible, colour sketches and notes were made at the respective times some of the following species of Opisthobranchia were brought under my notice. These have been used in the preparation of this short paper, particularly in placing the first two species on record from Australia for the first time.

Family **PLEUROBRANCHIDAE**

OSCANIUS MAMILLATUS Quoy and Gaimard
(Figure 1)

Oscanius mamillatus Quoy and Gaimard, 1833, *Voy. "Astrolabe," Zool.* II, p. 294, pl. 22, f. 6. Port Louis, Mauritius.

Animal very large, soft and tubercular, with a few larger conic tubercles scattered in places on the dorsal surface. Head tentacles united at the base; foot broad, rounded, and extended only very slightly behind when the animal was immobile. The animal was remarkable for its colour and pattern. General colour was light creamy fawn to palest pink in places, with large dark brown patches at intervals round the mantle edge. The tubercles were variegated with brown and yellow, and the intervals between them were reddish brown and yellow, with dark brown, irregular rings round the basal parts of the larger conic tubercles. Conspicuous along the mantle, head, and scattered elsewhere on the brown marginal patches were small white blotches and spots. These gave a peculiar "frothy" appearance to the animal on first glance, which temporarily detracted somewhat from its true appearance. Outstanding colour marking was that of a number of conspicuous, roughly crescent shaped splashes of crimson lake scattered here and there over the dorsal surface, with somewhat darker edges. Tentacles were dark brown outlined with darker red-brown.

Length of animal: Approximately 6 inches; *breadth*: 4½ inches.

Locality: Gunnamatta Bay, Port Hacking, south of Sydney, Australia. Amongst seaweed on the tidal flat at lowest tide level. 1st April, 1946.

Remarks: A large number of these was noticed by officers of the C.S.I.R.O. Fisheries Division (Gunnamatta Bay), who recognised them as "new arrivals" to the tidal flat there, but by the time I was notified the returning tide had swept them from sight. However, the following day a few more were seen on the flat at low tide, and one was collected and sent to me for identification. By the time I was available to go down myself, they had completely vanished, and, despite periodic searching, they do not appear to have been seen since that time to my knowledge. Their habitat is obviously well below low tide level. The plum-coloured *Oscanius hilli* Hedley was also about the flat in numbers at that time. Although permitting recognition of this species on sight, Quoy and Gaimard's figure indicates that the larger conic tubercles are more erect than in the specimen I had before me, but this was no doubt due to the soft, sluggish state in which the latter was found at Gunnamatta Bay. The tissues were extremely

* Former Curator of Shells, Australian Museum, Sydney, N.S.W.

soft, and the larger tubercles were relaxed and lying almost immersed amongst the smaller ones.

It is herewith recorded for the first time from Australia, and, as far as I know, from the Pacific.

Family **POLYCERIDAE**

CRIMORA LUTEA Baba
(Figure 2, 2a)

Crimora lutea Baba, 1949. *Opisthobranchia of Sagami Bay* (Tokyo), pp. 133-134, pl. X, f. 35. Off Kurosaki, Sagami Bay, Japan.

The species recorded here as an Australian record resembles Baba's figure and description closely, except apparently in size. The yellow to orange ground colour, blue-black spots and papillae, similar tufted blackish outgrowths along the dorsal centre of the tail, the dark gills on two projections from the back flanked on each side by two yellow protuberances, and the expanded head veil with blackish outgrowths, coincide well with the Japanese species. I noticed a peculiar feature on the two specimens forwarded to me (one much smaller) was a series of small compartments or pockets running down each side of the foot sole for about one-third its length (2a). I have no recollection of seeing that exactly on any nudibranch before, and neither Alder and Hancock (1862, *Ann. Mag. Nat. Hist.* 3, X, pp. 261-265) in their description of their genus *Crimora*, in which Baba places his species, or Baba himself mentions them, yet they are of some consequence in the specimens in question, I feel sure. A letter of mine to Dr. Baba (Tokyo) in 1956 regarding this feature has been recently returned to me marked "unknown."

Length of animal: In preservative 3 inches, smaller specimen one inch. Baba gives the length of his species as 3 mm., which may be a mistake, as that seems very minute, although his figure gives the impression it is only small.

Locality: Rodd's Harbour, Port Curtis, Queensland. In sandy mud, in small rock pool left by tide at very low level. Collected by John Bates, 8th June, 1952.

THECACERA PENNIGERA (Montagu)
(Figure 3, 3a)

Doris pennigera Montagu, 1815. *Trans. Linn. Soc.* (Lond), XI, 17, pl. IV, f. 5, Devon, England.

Thecacera pennigera Fleming, 1828. *Hist. Brit. Anim.*, 283.

Thecacera pennigera Alder and Hancock, 1855. *British Nudibranchiate Mollusca*, Mon. Fam. I, pl. XXI, f. 7.

The species *Thecacera pennigera* (Montagu) cannot be mistaken, and it must have been introduced into Australia in very recent years. A brief mention of it was made by Mr. F. E. Allen (1952, *Austr. Journ., Mar. Frhwat Res.*, 4(2), 307, 308), after I had confirmed its identification, but as I prepared a colour sketch at the time and a few notes which are available for reference, I am now elaborating on Mr. Allen's brief mention of the species.

The animal has a delicate, gelatinous white body, profusely marked with bright orange spots and dashes, with velvety black ones between them; large orange patches of the gills, round rhinophores, on dorsal protuberances, and posterior to the gills on each side. Tail is long and

pointed, the tip of which the animal uses to extend and balance itself from an object to which it may be clinging. Foot sole sparsely dotted with orange and black spots. Rhinophores set in widely expanded sheaths. Three tripinnate gills arise from a common stalk on the dorsal surface. All the above features are in common with those in the British species. Branchial appendages are set a little behind and on each side of the branchia.

Length of animal: Alive 1½ inches.

Locality: Found at White Bay Power Station, upper reaches of Sydney Harbour, Australia, 28th July, 1951. Collected by Miss B. Dew, C.S.I.R.O. Fisheries Division, during sea-water conduit inspections.

Remarks: An active, brilliantly marked animal unlike any other known species occurring here. The specimen brought to me, of which I made a colour sketch at the time, lived actively in a jar of seawater until 7/8/51.

During that time it laid an irregular creamy-yellow egg-girdle (3a). Some days later Miss Dew found more specimens of the species breeding in the same locality. Its appearance, or more correctly its observance in Sydney Harbour, was certainly a surprise, but obviously shipping played a strong part in its introduction from overseas. Certain molluscs of the Indopacific do appear at intervals in Australia, but a British species that survives and breeds under such different conditions is of interest especially to the student of marine zoogeographical problems.

As I said above, a brief mention of observing this nudibranch in Sydney Harbour for the first time was made by Mr. F. W. Allen, but above notes and illustration further substantiate his record of it in South Pacific waters.

Family **PHYLLIDIIDAE**

PHYLLIDIA ELEGANS Bergh

Phyllidia elegans Bergh, 1896. *Bidrab til en Monograph of Phylliderni, Naturhist. Kjobenhavn*, Ser. 3, Vol. V, pp. 357-542, Tab. XVIII B, XIX, Philippines.

Locality: Hayman Island, Queensland. Collected A. W. C. de Witte, August, 1956.

This specimen of nudibranch was exhibited by Dr. D. F. McMichael at the August monthly meeting of the Linnean Society of New South Wales last year as a new specific record for Australia. Notification of it appeared in *Abstr.* 662, *P.L.S.N.S.W.*, 29th Aug., 1956, and later (1957 *Proc. Linn. Soc.*, 81, 3, 316-317) in the same abstract form. The genus is already recorded from Western Australia, where *Phyllidia varicosa* Lamarck, 1801, is listed from Dampier Archipelago. Whether that species in Western Australia has been correctly named remains to be seen. It may later be found that the two species, from east and west of the continent, are the same species, which is not unlikely. The species *P. varicosa*, which Eliot (*Some Nudibranchs from East Africa and Zanzibar*, 1904, *Proc. Zool. Soc.*, Lond., 268-298) described as having a broad black line running along the foot (sole) and is absent from several other species of *Phyllidia*, I believe is close to the species *P. elegans*. A detailed comparison between the so-called Western Australian *P. varicosa* and the Queensland species recorded as *P. elegans*, which incidentally has the same black line on the foot sole, would confirm their true identification, and their relationship, if any other than generic, to one another.

As it now stands, *P. elegans* Bergh, is a specific record for Australia and a generic record for all Australia except Western Australia.

Family **DORIDIDAE**

GLOSSODORIS WESTRALIENSIS O'Donoghue

Glossodoris westraliensis O'Donoghue, 1924. *Trans. Linn. Soc.*, Lond., XXXV, pp. 554-556, Abrolhos, Western Australia.

Locality: Hayman Island, Queensland. Collected by A. W. C. de Witte, August, 1956.

This specimen from Queensland was exhibited also by Dr. D. F. McMichael at the August monthly meeting of the Linnean Society last year, and was recorded in the same Abstracts as a new record for Queensland. The species *Glossodoris westraliensis* has hitherto been recorded from Western Australian localities only. It may be found eventually in North Australia, thus providing the species with a more continuous range than the rather interrupted one this eastern record sets.

Dr. McMichael brought this to my attention recently in the Australian Museum as an interesting eastern record. The specimen is typical in size, colour, pattern and general structure of the Western Australian form, of which I have already given a colour illustration (*Australian Shells*, 1950 pl. 28, f. 11), and further description is not necessary here.

Family **FLABELLINIDAE**

FLABELLINA IANTHINA Angas

Flabellina ianthina Angas, 1864. *J. de Conch.*, ser. 5, Tom. iv., p. 66, pl. VI, f. 6. Watson's Bay, Sydney Harbour (Port Jackson), Australia.

? *Pteraeolidia semperi* Baba, 1949. *Opisthobranchia of Sagami Bay* (Tokyo).

The ability of this nudibranch to display at intervals beautiful and brilliant luminosity with a constant colour change is remarkable. It can be olive-green or blue or completely liver coloured, but can quickly change to opalescent violet and violet-blue shades, in which state it becomes a creature of great beauty. It is probably the largest of the Aeolid Nudibranchia found in Australia, and also one of the rarer ones.

Fortunately, I had a living specimen of this in the Australian Museum when I received a copy of *Opisthobranchia of Sagami Bay* (Tokyo), 1949, in which Dr. Baba (p. 182, pl. XLIX, p. 165) describes and gives a good illustration of a specimen he identifies as *Pteraeolidia semperi* (Bergh), 1870. The Sydney species during its captivity showed several changes, finally becoming partly, then completely, olive-fawn, progressing from that to an all-over violet-blue greenish shade, similar to that which Baba shows in his illustration, which, when compared with the former, would give the impression it had been prepared from the actual living specimen from Sydney. Taking external features into consideration, and finally the unusual violet-blue with a tinge of green colour, leads me to think that the Japanese species is the same as *Flabellina ianthina* Angas, 1864, one of our rarer Aeolid Nudibranchia. I am therefore synonymizing them tentatively, and, if I am correct in this, the latter name has priority over that given to the Japanese species.

AUSTRALIAN OPISTHOBRANCHIA

Fig. 1—*Oscanius mamillatus* Q. and G.

Fig 2, 2a—*Crimora lutea* Baba.

Fig. 3, 3a—*Thecacera pennigera* (Montagu).

THE LIGHTNING VOLUTE

ERICUSA FULGETRA Sowerby

By BERNARD C. COTTON,* F.R.Z.S.,
Curator of Molluscs, South Australian Museum.

The "Lightning Volute" *Ericusa fulgetra* of South Australia is keenly sought after by collectors. It was first named, described and figured in colour by Sowerby, 1825, in the Sale Catalogue of the Earl of Tankerville's collection—the only specimen then known—and it is now in the British Museum. The specimen is No. 2149 in the catalogue, and in our copy the price, £31/10/-, is written against it. Sowerby, 1847, *Thes. Conch.*, 1, p. 207, sp. 35, pl. 47, fig. 33, 34, again describes and figures the species without locality. Reeve, 1849, was the first to give the locality, "South Australia," incorrectly quoting Broderip, 1826, as the author of the species. Like many volutes, the mature shell varies in size, ranging from three inches to eight inches in length. It has been found right along the South Australian coast in shallow water, crawling on sand banks, but it is much more common on Yorke Peninsula and on the west coast of South Australia, particularly about Port Lincoln.

One rare variety somewhat different in shape has been found in the Great Australian Bight in 120 fathoms, inside the Western Australian border. Between Coobowie and Wool Bay, on the east coast of Yorke Peninsula, the tides sometimes form a sand-bar, which is exposed at a very low tide to the heat of the sun. When the sea begins to cover the bar, as the tide rises, these volutes and also such shell as the "False Helmet" (*Hypocassis bicarinata*) and "Lyre Shells" (*Lyria mitraeformis*) emerge from the sand. A dozen or so "Lightning Volutes" have been taken in a few hours. The late Sir Joseph Verco described eight varieties of this remarkable Volute shell.

The typical "Lightning Volute" is not found in deeper waters where specimens are usually found of the *dictua*, *lunisligata* or *connectens* varieties. There is some variation in shape, but the plate reproduced here shows the respective colour patterns.

An interesting specimen taken by Jim Veitch starts off in life as a typical *E. fulgetra lunisligata*, but after an accidental break in the shell, it continues as a typical *E. fulgetra*. This change in colour scheme frequently occurs in variable patterned shells following a repair after damage.

---

* Adelaide, South Australia.

EXPLANATION OF PLATE.

Fig. 1. *The Lightning Volute, Ericusa fulgetra* Sowerby. Typical, axially flamed.

Fig. 2. *The Crescent Volute,* variety *lunisligata* Verco, 1912, with two spirals of large crescentic or arrow-headed spots.

Fig. 3. *The Spotted Volute,* variety *punctisligata Verco,* 1912, with two rows of small spots.

Fig. 4. *The Two Banded Volute,* variety *bicincta* Verco, 1912, with two spiral bands only.

Fig. 5. *The Three Banded Volute,* variety *tricincta* Verco, with three spiral bands.

Fig. 6. *The One Banded Volute,* variety *unicincta* Verco, 1912, with only a lower spiral band present.

Fig. 7. *The White Volute,* variety *alba* Verco, 1912.

Fig. 8. *The Connected Volute,* variety *connectens* Verco, 1912, with two continuous spiral bands crossing the normal axial flames. This is a rare variety, usually very small in mature size. Here is figured the largest and best specimen ever seen, six and a quarter inches long, dredged alive by Mr. J. Veitch at Port Lincoln.

Fig. 9. *The Net Volute,* variety *dictua* Verco, 1909. The type was taken in a cray-pot off Granite Island, Port Victor. It is not infrequently obtained under similar circumstances in the same locality. It has a delicate, lace-like pattern instead of the bold zig-zag axials of the typical variety.

Fig. 10. *The Boat Volute, Ericusa orca* Cotton, 1952. This is the rare, deep water relative of *E. fulgetra* from the Great Australian Bight. It is differently shaped from the typical *E. fulgetra.*

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

ON SOME OPISTHOBRANCHIA FROM VICTORIA

By ROBERT BURN†

(Read 25th March, 1957)

INTRODUCTION

This paper presents the information gained from the examination of a collection of Opisthobranchia taken by the author at a number of localities along 120 miles of coastline centering on Port Phillip Heads, Victoria.

The results have been rather gratifying; 35 species, of which 10 are described as new, are recorded. One new genus is described and 22 recorded. Most specimens were collected at low tides under stones, but some were collected at dusk when the animals crawl about feeding on the various seaweeds. These nocturnal specimens were easily picked off the seaweed and placed in a jar of seawater for later study.

One comes to the conclusion from the type of species collected that the waters along the Victorian coastline are gradually warming up. Tropical and sub-tropical genera found here, although not as large as from warmer seas, are now appearing in our waters. Some such genera are *Aglaia, Cyerce, Glossodoris, Thordisa, Madrella, Melibe* and *Hervia.* Some species prove so common all the year round that it seems unlikely that they should not have been previously recorded.

Since this paper was written, a further number of species have been collected which are not recorded in this paper; some appear to be new species. These will be presented in a later paper.

Dimensions mentioned in descriptions are of the largest specimens so far collected by myself.

Type specimens are to be presented to the National Museum, Melbourne, Victoria.

SYSTEMATIC LIST OF OPISTHOBRANCHIA FROM VICTORIA

* Denotes species not previously recorded from Victoria.

	Phylum	MOLLUSCA
	Class	GASTROPODA
	Subclass	OPISTHOBRANCHIA
I	Order	Cephalaspidea
	Sub Order	Philinacea
	Family	Philinidae
		Philine angasi (Cross & Fischer)
	Family	Aglaiidae
		* *Aglaia taronga* Allan
II	Order	Anaspidea
	Family	Aplysiidae
		Aplysia parvula Morch
		* A. *angasi* Sowerby
III	Order	Sacoglossa
	Sub Order	Elysiacea
	Family	Calliphyllidae
		* *Cyerce nigra pallens,* subsp. nov.

† Geelong, Victoria, Australia.

IV	Order	Notaspidea
	Sub Order	Pleurobranchacea
	Family	Pleurobranchidae
		* *Pleurobranchus punctatus* Quoy & Gaimard
		* *Pleurobranchaea novaezealandiae* Cheeseman
V	Order	Nudibranchia
	Sub Order	Doridacea
	Super Family	Eudoridacea
	Group	Phanerobranchia
	Family	Euphuridae (= Polyceridae)
		* *Euphurus multidigitalis*, sp. nov.
		* *Palio cooki* (Angas)
		* *Nembrotha arnoldi*, sp. nov.
	Group	Cryptobranchia
	Family	Doridae
		* *Glossodoris victoriae*, sp. nov.
		* *G. tasmaniensis* (Bergh)
		* *Glossodoris perplexa*, sp. nov.
		* *G. haliclona*, sp. nov.
		* *G. alternata*, sp. nov.
		Ceratosoma brevicaudatum Abraham
		* *Rostanga arbutus* (Angas)
		* *Praegliscita*, gen. nov.
		Type species
		Doris chrysoderma (Angas)
		Alloiodoris marmorata Bergh
		Staurodoris pustulata (Abraham)
		Archidoris varia (Abraham)
		* *Thordisa sabulosa*, sp. nov.
		* *Halgerda graphica* Basedow & Hedley
		* *Dendrodoris aurea* (Quoy & Gaimard)
		D. carneola (Angas)
		D. nigra (Stimpson)
		* *D. staminea* (Basedow & Hedley)
		* *D. albopurpura*, sp. nov.
		* *D. davisi* Allan
	Sub Order	Arminacea
	Super Family	Pachygnatha
	Family	Madrellidae
		* *Madrella sanguinea* (Angas)
	Sub Order	Dendronotacea
	Family	Tethyidae (= Fimbriidae)
		* *Melibe australis* Angas
		* *M. pellucida*, sp. nov.
	Sub Order	Eolidacea
	Super Family	Cleioprocta
	Family	Facelinidae
		* *Hervia ornata* (Angas)
		* *H. newcombi* (Angas)
		* (?) *H. peonicia*, sp. nov.

PHILINE ANGASI (Crosse & Fischer)

Bullaea angasi Crosse & Fischer, 1865, *Journ. de Conch.*, 13, p. 38, pl. 2, f. 8.

Large, elongate oval body, up to 60 mm. in length. Very slimy. Colour white with very little variation. Shell large, upward of 20 mm. long; internal, covering the posterior disk; transparent white in colour; large body whorl and aperture, very thin and frail. Radula formula 24 x 1.0.1.

Locality: Port Phillip Bay.

Station: Very common; sand bars; sandy mud flats and shallow water dredgings.

AGLAIA TARONGA Allan

Aglaia taronga Allan, 1933, *Rec. Aust. Mus.*, 18, No. 9, p. 444, pl. 56, f. 1-3.

Small; body cylindrical, divided into anterior and posterior disks. Shell very small, white, few whorled without a spire, on right hand side of rear of posterior disk. Gill long, plumose, passing across the body under the shell, protected by the tail lobes of the posterior disk. Colour velvet black, edges of lobes white with a secondary row of orange; either side of the anterior disk lined with an orange streak. There is an interrupted white hair line from the mouth to the very dark tail of the anterior disk. Upper exposed surfaces with general yellow flecking. Inner surfaces light grey. Size of above described specimen 22.5 x 9 mm.

Locality: Swan Bay, Port Phillip (1 spec. Dec., 1956).

Station: Very uncommon; crawling on *Posidonia* at low tide.

Remarks: There are probably a further two species of *Aglaia* occurring in Victoria, but at present they are undescribed or unidentified.

APLYSIA PARVULA Morch

Aplysia parvula Morch, 1863, *Journ. de Conch.*, p. 22.

Body small, up to 88 mm. in length; long narrow neck with large rhinophores and cephalic tentacles; parapodia medium, united behind, not used for swimming; mantle with a large aperture through which crown of shell protrudes; with a small purple gland; and a sucking disk on the posterior end of the foot. Colour fawn to dark brown, blotched with white; edges of parapodia, rhinophora, siphon and cephalic tentacles always edged with black. Mantle aperture edged with black, from which white patches radiate to give a rayed effect. Shell small, up to 22 mm. long by 10 mm. wide, strongly convex, horny and rather tough in texture; colour brown. Radula formula 15-20 x 12.1.12.

Locality: Torquay, Apollo Bay, Barwon Heads, Flinders.

Station: Common, under stones and crawling on weed on open coast reefs. During December, 1956, large number of minute specimens of this species were observed in every pool at Torquay; sizes ranged from 3 mm. to 10 mm. in length.

Remarks: *Aplysia norfolkensis* Sowerby, 1869, from Sydney, appears very similar to *A. parvula* Morch, a species of apparent world-wide distri-

bution. Radula features are similar, that of the latter ranging from 22 x 12.1.12 to 35 x 18.1.18, while the former is 15-20 x 12.1.12. It would then appear that A. *parvula* is the correct name, as it has six years' priority.

APLYSIA ANGASI Sowerby

Aplysia angasi Sowerby, 1869, *Conch. Icon.*, 17, pl. 8, sp. 35. Body small, plump or rounded, upward of 100 mm. Parapodia rather large, separated behind. Mantle aperture nearly closed, with a small papilla at the spot. Siphon large. Rhinophores long and linear. Cephalic tentacles short, irregular along the outer edges. Penis cylindrical, 10 mm. long; a curved spur 4 mm. long extends from the papilla on the round end. Penis protrudes from the genital groove anteriorly between the head and the foot. Foot without a sucking disk. Gill large, never extended or exposed. Shell small 25 x 17 mm., elongate-oval, slightly convex, thin, transparent and frail. Radula formula 33 x 25.1.25. Colour varying from fawn to brownish-green, always with a few darker brown patches on the parapodia and neck; exposed surfaces covered with fine, dark brown interlacing veins. Gill olive. Inner surfaces of parapodia fawn without markings. Foot yellow, vacant of markings. Shell brown.

Locality: Torquay (3 spec. Dec., 1956).

Station: Uncommon, clustered together under stone, mid-tide.

Remarks: Yet another species is recorded from Victoria as A. *tigrina* Rang (correctly A. *sowerbyi* Pilsbury). This is incorrect, as the Victorian species is not the same as the species from New South Wales. But until further material comes to hand the naming of the Victorian species must be left in abeyance.

CYERCE NIGRA PALLENS, subsp. nov.

(Pl. iII, fig. 8-11)

General body shape typical of *Cyerce*, 50 mm. long and 20 mm. wide excluding the branchial papillae. Head with corners produced to form linear orals. Rhinophores solid, cylindrical, medium length, bifurcated at the upper end. Branchial papillae in eight rows along the mantle-margin; attaining largest size posteriorly in the inner row. Branchial papillae medium, foliaceous, caducous; consisting of a short stalk and a large broadly lachrymose leaf-like lamina, finely denticulated along margins; the liver ramifications visible in each lamina. Foot broad, antero-lateral corners nearly square, notched anteriorly, tapering to a blunt point behind. Genital oriface below and posterior to the rhinaphores. Pericardium large, soft and balloon-like, pulsates as the animal breathes. Colour generally velvet-fawn, dorsum salmon pink flecked with white, foot fawn speckled with minute brown spots. Branchial papillae olive-fawn marked with short light blue streaks on the upper side, and on the reverse side with small light blue dots.

Locality: Queenscliff (4 spec. Oct-Nov., 1956; 5 spec. May, 1957).

Station: Rather rare, crawling on seaweed at extreme low tide.

Remarks: Differs from the true C. *nigra* Bergh, 1877, in being much paler, particularly in the dorsal area. The patterning on the branchial papillae also differs considerably from the true species in general position of markings. This variety may warrant specific rank rather than just varietal status. This is the most southern record of the genus and only the second record from Australia.

PLEUROBRANCHUS PUNCTATUS Quoy & Gaimard

Pleurobranchus punctatus Quoy & Gaimard, 1832, *Voy. "Astrolabe" Zool.*, 2, p. 299, pl. 22, f. 14.

Body medium size, broadly oval, up to 44 x 32 mm., mantle large, twice as wide as foot. Ctenidium large, rachis smooth; always concealed under mantle. Rhinophores long, stout; cylindrical, longitudinally folded throughout their length. Eyes posterior to base of rhinophores. Shell small, ¼-⅓ of body length, nearly square, but slightly narrower behind; very flat, of 1½-2 whorls, fragile. Colour pale cream to pale yellow. Shell transparent amber. Some specimens have white spots on the mantle.

Locality: Portarlington; Breamlea; Flinders; Lorne; Blanket Bay.

Station: Very common, under stones between tide levels; usually found in pairs.

Remarks: The egg ring, about 18 mm. diameter, of ¾ of one whorl, is a clear gelatinous mass enclosing the minute spheres of cream or yellow eggs. Egg rings were first observed in October, 1954, and in March, 1955, minute specimens up to 5 mm. in length appeared.

PLEUROBRANCHAEA NOVAEZEALANDIAE Cheeseman

Pleurobranchaea novaezealandiae Cheeseman, 1878, *Proc. Zool. Soc., Lond.*, p. 276, pl. 15, fig. 3.

Quite large, about 65 x 24 mm. Mantle small, not covering head or foot, but continued forward into the head-veil and posteriorly into the tail. Head-veil with corners produced to form linear tentacles; margin between tentacles finely serrated. Right margin of mantle extending over the large ctenidium. There is no shell. The sole of the foot has a pedal gland posteriorly. Colour yellowish-grey, exposed surfaces streaked with irregularly anastomosing lines of black; sole brown, ctenidium light grey. Radula formula 36 x 53-65.0.53-65 to 46 x 60-65.0.60-65.

Locality: Lorne, Apollo Bay (1 spec. from each locality, Dec., 1956).

Station: Uncommon, in sandy positions under stones near high water level.

Remarks: This species differs from the previous species in that it lacks a shell; the mantle is continuous anteriorly and posteriorly into the head and tail, and the peculiar lined colouring. The animal is predatory, eating other sea-slugs, etc., placed in an aquarium along with it.

EUPHURUS MULTIDIGITALIS, sp. nov.
(Pl. 11, fig. 1-6)

Animal limaciform, very small, about 10 x 2.5 mm. in size. Pallial ridge with 42 evenly spaced papillae, each one with 4 or 5 points resembling fingers. Dorsum separate from tail, irregularly and minutely pustulose. Foot long, narrow, deeply notched in front, foot corners rounded and curled back; grooved full length. Rhinophores small, rectractile within sheathed cavities, obliquely laminated with 12 laminae. Branchiae 3, bipinnate, sub-retractile within a small crescent-shaped cavity. Orals formed by thickened outer lips of head. Genital opening midway along length of dorsum. Colour pale yellow; pustules clear, with a black spot in each; papillae black with clear tips; rhinophores, branchiae and foot white. Underside of mantle pale yellow speckled with black; a noticeable cluster of dots in front of the head.

Locality: Torquay (2 spec. Dec., 1955).

Station: Under stone at low tide.

Remarks: The only other Australian species to date, *E. yatesi* Angas, 1864, from Sydney, is much larger, with fewer papillae surrounding the dorsum.

PALIO COOKI (Angas)

Polycera cooki Angas, 1864, *Journ. de Conch.*, 12, p. 58, pl. V, f. 6.

Body small, limaciform, about 10 mm. in length and 3 mm. in width. Dorsum separated from sides by pallial ridge, but continuous into tail. Pallial ridge consists of a row of fine-pointed serrations which gradually die out posteriorly. Rhinophores large, sub-clavate, rectractile, laminated with 8 very oblique laminae. Branchiae 5, bipinnate, retractile within a large crescent-shaped cavity. General body colour bright orange speckled with minute strawberry-red dots, foot white. Pallial ridge strawberry-red.

Locality: Breamlea (1 spec. Nov., 1955); Torquay (2 spec. Dec., 1955).

Station: Under stones near low tide.

NEMBROTHA ARNOLDI, sp. nov.
(Pl. II, fig. 13-14)

Body small, limaciform, dimensions up to 18 x 6 mm.; general form typical of *Nembrotha*. Body minutely spiculose. Rhinophores large, clavate, with 9 laminae, retractile within sheather cavities. Branchiae small, 5, tripinnate, sub-retractile arranged in a semi-circle about the small protrudent anus. Branchial cavity equipped with 3 flaps corresponding with the 3 central branchiae. Oral tentacles linear, but rather short. Genital opening large, sheathed; penis semi-transparent, stout at base and for half the length, then twisted to the rear and tapering to a sharp point. Colour varying from pink to dark brownish-red, sometimes with a few yellow markings on the sides. Rhinophores, branchiae, anal tube and orals yellow. Foot paler than upper surface, outlined with yellow.

Locality: Torquay (3 spec. Mar., 1 spec. Nov., 1956).

Station: Very uncommon, under stones at low tide.

Remarks: Differs from other Australian species in small size and rather dull colouring. This species is named in honour of the late Rev. John K. Arnold—a very good friend and capable teacher, who showed me how and where in conchological collecting.

GLOSSODORIS VICTORIAE, sp. nov.
(Pl. III, fig. 4)

Body medium size for the genus, about 30 x 7 mm., elongate-oval, mantle narrow. Dorsal surface of mantle with a few low postules, longitudinally ridged or grooved to give a rather flat corrugated appearance. Rhinophores medium, clavate, with 14 laminae, retractile. Branchiae 12, surrounding the anus. Colour white, tinted with pink; mantle and upper edge of foot encircled by a ring of large pink or red dots; grooves on mantle lined pale blue; postules on mantle tipped red. Rhinophora, branchiae, head and foot white. Radula formula 35 x 27.0.27.

Locality: Portarlington (3 spec.), Torquay (2 spec., type locality).

Station: Fairy common, under stones and on weed at low water.

Remarks: Differs from the next species in lacking red colour spots in the central dorsal area, and smaller size.

GLOSSODORIS TASMANIENSIS (Bergh)
(Pl. II, fig. 10)

Chromodoris tasmaniensis Bergh, 1905, *Reis. im. Arch. der. Phil.*, 6 (2), p. 69, pl. V, f. 12-15.

Body of above species, length up to 55 mm. Dorsal surface of mantle smooth. Rhinophores small, with 18-20 oblique laminae. Branchiae 10, surrounding large protrudent anus. Colour white, a single or double row of reddish-orange spots just inside the mantle margin; medium part of the back marked with reddish-orange spots, sometimes many, sometimes few. Upper edge of foot encircled by a row of spots as is mantle. Rhinophores white. Branchia white, rachis of each red on the inner side and with 2 red dashes on reverse side. Radula formula 42 x 34.0.34.

Locality: Torquay (1 spec. Mar., 4 spec. Oct., 1956).

Station: Common, under stones and crawling among seaweed.

Remarks: *G. tasmaniensis* Bergh, type locality Ulverstone, Tasmania, has not been collected since originally described in 1905. Specimens from Torquay, although showing certain colour variations, apparently belong to this species. Differs from the previous species in larger size and the smooth dorsal surface.

GLOSSODORIS PERPLEXA, sp. nov.
(Pl. III, fig. I.)

Body small, length up to 17 mm. General body-colour white, the median part of the back sparsely springled with red spots; a row of purple markings just inside the mantle margin. Underside of mantle similar, but markings much fainter. Sides and tail with a few red spots. Tail faintly mauve. Rhinophores red, with 6-8 laminae. Branchiae 10, yellow.

Locality: Torquay (1 spec. Oct., 1956).

Station: Very rare, crawling on seaweed.

Remarks: Somewhat similar to *G. aureopurpurea* (Collingwood), but differs in being smaller and having red dorsal spots instead of yellow.

GLOSSODORIS HALICLONA, sp. nov.
(Pl. III, fig. 2)

Body small, length up to 15 mm. General body-colour bright pink; mantle margin edged with white, inside which is a second interrupted row of white; dorsal surface minutely spotted with red. Rhinophores large, with 8-9 laminae, yellowish-pink. Branchiae 8-9, pinnate, pink.

Locality: Portarlington.

Station: Rather uncommon, alive on pink sponge *Haliclona* found under stones below low tide.

Egg ring an incomplete ellipse, 4 mm. broad and 2 mm. high; eggs cream in a clear gelatinous mass.

Remarks: Allan, 1947, mentioned a small unnamed *Glossodoris* from Angourie which may be the same as this. The colours are similar except for the mantle margins, rhinophores and branchiae.

GLOSSODORIS ALTERNATA, sp. nov.
(Pl. I, fig. 10-11)

Body small, length up to 18 mm. General body-colour mauve; medium part of mantle an irregular area of orange, with a few bright

metallic green spots; remaining portion of mantle mauve broken by white patches, which appear to radiate from some central point. Underside of mantle similar. Rhinophores rather large, with 7 laminae. Branchiae small, 6, bipinnate, sub-retractile, white. Radula formula 40 x 29.0.29; outer teeth not denticulate.

Locality: Portarlington (type locality); Torquay.

Station: Rather common, under stones and crawling on weed.

Remarks: A very distinctive little species not easily confused because of its striking colours. One specimen 12 mm. long from Portarlington had both rhinophores emerging from the one large cavity; the right-hand rhinophore was bifurcated and had laminae on both heads.

CERATOSOMA BREVICAUDATUM Abraham

Ceratosoma brevicaudatum Abraham, 1876, *Ann. Mag. Nat. Hist.*, Ser. 4, p. 142, pl. 7, and f. 6.

Body smooth, rather hard in consistency, up to 100 mm. in length. Mantle produced posteriorly into a nipple-like protuberance. Tail half as long again as mantle. Branchial plumes large, many in number, intergrown at the base, simply pinnate, retractile, surrounding anus in a semi-circle. Rhinophores clavate, retractile, with many oblique laminae. Orals stout, tapering to blunt points. General body colour pinkish-orange, profusely spotted on the sides with small red and blue spots. Mantle margin reddish, with a few dark red spots and white patches. Median part of mantle with purple or mauve spots, both large and small. Rhinophores and branchiae red. Mantle tail bright red, seemingly pustulose. Radula formula 80 x 140.0.140.

Locality: Portarlington; Shoreham; Flinders; San Remo.

Station: Fairly common, under stones between tides. One of the more common species in Western Port.

Remarks: After considering a large series of this species I have concluded that the small species from South Australia, *C. adelaidae* Basedow & Hedley, 1905, is but the juvenile of this species and should be reduced to synonymity.

ROSTANGA ARBUTAS (Angas)

Doris arbutus Angas, 1864, *Journ. de Conch.*, 12, p. 47, pl. 4, f. 4.

Length up to 40 mm., width up to 22 mm. Body broadly ovate. "Mantle covered everywhere with closely-set villous papillae strengthened by divergent spicules extending from base to apex. General integument also rich in spicules. Rhinophore—sheaths and branchial cavity papillate similarly to the general dorsum. Branchial plumes 6-9, bipinnate, arranged in a complete circle around the anus. Representative radula formula 60 x 50-60.0.50-60" (Baba, 1949, p. 149). Oral tentacles linear. Rhinophores slit in front, apex cylindrical, with very many laminae. Colour variable; usually bright red; rhinophores red with slit and apex yellow; branchiae red; base of branchial plumes black in some specimens.

Locality: Breamlea (1 spec. June, 1955); Lorne (3 spec. Dec., 1956); Blanket Bay (1 spec. Dec., 1956).

Station: Not uncommon, under stones between tides; egg rings are bright orange-red, up to 15 mm. overall diameter, of 3 or 4 whorls; the eggs are laid vertically in double rows.

PRAEGLISCITA, gen. nov.

Type species—*Doris chrysoderma* Angas, 1864.

Animal enlongate-oval, slightly narrower medianly; soft, highly convex. Mantle nodulose; nodules high, abrupt in form, apices rounded; interstices flat, smooth. Branchiae bipinnate, many in number, arranged in a complete circle around the anal papillae. Rhinophores conical-clavate, laminated. Rhinophoral and branchial cavities in centre of rather deep depressions; not sheathed but lips minutely papillate. Foot broad and flat. Head small; orals mere ridge-like expansions as in *Dendrodoris*. Genital oriface large, prominent, divided vertically by a thin membrane. Elements of labial disk simple. Radula consists of many rows of simply hamate teeth, no central tooth; first inner lateral broad with a minute hook, next four becoming narrower but ascending in size and length of hooks. Outer six descending sharply, set closely together; outer tooth minute, without a hook.

Remarks: This genus resembles *Rostanga* in the general shape of the mantle and the formation of branchial plumes, but, ventrally, it resembles *Dendrodoris* with a broad flat foot and simple ridge-like expansions for the oral tentacles.

PRAEGLISCITA CHRYSODERMA (Angas)
(Pl. 1, fig. 1-5)

Doris chrysoderma Angas, 1864, *Journ. de Conch.*, 12, p. 46, pl. 4, f. 3.

Body as for genus, up to 40 mm. in length and 16 mm. in breadth. Nodules large in median area of mantle and decrease in size towards the margins. Branchiae 7 in number, rather like segments of a cut orange with the vertical axis the rachis of each plume. Clavus of rhinophores a rounded-cone, on stalks narrower but same length as clavus; clavus with 15-20 laminae. General body-colour chrome yellow, nodules capped with white. Rhinophores and branchiae orange. Underside of mantle marked with vein-like muscle tracery. Radula formula 37 x 78.0.78; teeth as for genus.

Locality: Queenscliff (1 spec. April, 1956); Torquay (4 spec. Oct., 1956).

Station: Rather common, crawling on seaweed and stones.

Remarks: This species is apparently rare in the type locality, Sydney Harbour, as only a few specimens have been collected in the intervening 97 years since the type was taken.

ALLOIODORIS MARMORATA Bergh

Alloiodoris marmorata Bergh, 1905, *Reis, im. Arch. der Phil.*, 6, p. 42, pl. 3, f. 12-19.

Body elliptic, rather firm, up to 26 mm. long and 15 mm. broad. Mantle has a rather matt appearance. Foot notched anteriorly. Orals digitiform. Rhinophores clavate, retractile, laminated. Branchiae 7-8, retractile, tripinnate. General body colour grey, mantle and sole minutely speckled with dark brown; dorsal surface with numerous white spots, each surrounded by an area of dark brown. Underside of mantle marked with a few dark brown spots. Rhinophores and branchiae dark brown. Radula formula 39 x 19.0.19.

Locality: Portarlington; Sutherlands Bay, Phillip Island.

Station: Common, under stones between tides.

Remarks: This species, although rather drab dorsally, is very sharply defined ventrally.

STAURODORIS PUSTULATA (Abraham)

Doris pustulata Abraham, 1877, *Proc. Zool. Soc.*, p. 205, pl. 29, f. 18-19.

Length up to 45 mm., breadth 30 mm. Body broadly elliptic, rather firm. Mantle covered by numerous opaque warty tubercles of various sizes, sharply defined in appearance, larger on the median part, more numerous towards the margins. Rhinophores clavate, laminated, retractile. Branchiae 8, tripinnate, retractile along with the anal tube. Rhinophoral cavities each surrounded by a ring of pustules. Branchial cavity elliptic, transverse to the body, surrounded by a ring of postules. Foot narrow, upper laminae notched; orals stout, digitiform. General body-colour yellow-orange; rhinophores fawn; branchiae fawn or brown. Radula formula 26 x 38.0.38.

Locality: Flinders; Torquay; Blanket Bay.

Station: Extremely common, under stones near low tide level.

ARCHIDORIS VARIA (Abraham)

Doris variabilis Angas, 1864, *Journ, de Conch.*, 12, p. 44, pl. 4, f. 1, preocc.

Doris varia Abraham, 1877, *Proc. Zool. Soc.*, p. 209.

Body elongate-elliptic, wider in front than behind, up to 22 mm. in length. Mantle soft, covered with a multitude of varying-sized flat-topped nodulations; very close together. Branchiae 5, trippinate, sub-retractile; anal papilla frilled around edge. Branchiae surround anus in a semi-circle. Rhinophores clavate, with 10-12 laminae, retractile within cavities lipped with a row of co-joined nodules. Foot narrow, bi-laminate; head large; orals large, broadly triangular. Colour fawn-orange or greenish-fawn, always appearing blotchy. Rhinophores and branchiae lighter than body-colour. Radula formula 37 x 65.0.65.

Locality: Breamlea (2 spec. Oct., 1956); Queenscliff (6 spec. Nov., 1956).

Station: Common, crawling on seaweed in pools.

THORDISA SABULOSA, sp. nov.

(Pl. I, fig. 6-9)

Length up to 22 mm., width 14 mm. Animal broadly oval or roughly square. Mantle entirely covered with thick-set pointed papillae, margins finely denticulate. Branchiae 6, bipinnate, retractile, surrounding anal tube. Branchial cavity with 6 distinct triangular lobes corresponding to the gaps between plumes. Rhinophores linear, clavus slightly larger than stalk, with approximately 20 very fine laminae, retractile. Foot narrow, grooved; head large, rounded; orals linear. General body colour ochraceous-yellow; dorsal papillae bright yellow; underside of mantle with numerous laterally-placed dark brown spots; rhinophores fawn, laminae of clavus dark brown; branchiae fawn. Radula formula 46 x 36-41.0.36-41. Teeth simply hamate, hooks very elongate. Innermost lateral minute, next 14 ascending in size: outer 6-7 laterals descending, faintly split at the tips.

Locality: Torquay (type locality, 1 spec. Nov., 1956); Queenscliff (1 spec. Nov., 1956).

Station: Rare, under stones in sandy positions, low tide.

Remarks: The animal exudes an adhesive fluid from the papillae on the mantle. These in turn become thickly encrusted with grains of sand and give the animal a much different appearance. This species, because of the spear-head papillae or spikes covering the mantle, cannot readily be confused with any other southern Australian nudibranch described to date.

HALGERDA GRAPHICA Basedow & Hedley

Halgerda graphica Basedow & Hedley, 1905, *Trans. Roy. Soc.*, S. Aust., 29, p. 152, pl. 3, f. 1-4.

Body small, soft, elliptic; up to 15 mm. in length. Mantle minutely granular. Rhinophores clavate, small, retractile, laminated. Branchiae 6, small, bipinnate, very distinct. General body-colour pale yellow; mantle with numerous evenly spaced black spots (without the red lines as has the type); underside of mantle with a number of black spots; foot and orals outlined with pale orange. Rhinophores and branchiae black. Radula formula 40 x 40.0.40.

Locality: Torquay (1 spec. Feb., 1954).

Station: Rare, under stone in running water, low tide.

DENDRODORIS AUREA (Quoy & Gaimard)

Doris aurea Quoy & Gaimard, 1832, *Voy. "Austrolabe," Zool.*, 2, p. 265, pl. 19, f. 4-7.

The species of this genus have the following characteristics in common: Body soft, slimy, elongate-elliptic; mantle broad, usually smooth; rhinophores large, laminated, retractile; branchiae large and bushy, up to 8 in number, tri-or quadipinnate, retractile, surrounding anal papillae. Foot broad and smooth; head small; orals short, ridge-like. There is no radula.

This species is about 55 mm. long. Head very small. Branchiae large and bushy, 5 in number. Rhinophores small for the size of the animal. Mantle smooth or minutely blistered. General body colour orange with or without small white patches on the mantle. Rhinophores and branchiae light brown.

Locality: Portarlington.

Station: Rather common, under stones between tides.

Remarks: Egg ring consists of 2 spiral whorls, overall diameter 50 mm., depth 10 mm., width 1 mm.; of some hundreds of vertical rows of minute yellow eggs, 15 eggs to a row.

DENDRODORIS CARNEOLA (Angas)

Doris carneola Angas 1864, *Journ. de Conch.*, 12, p. 48, pl. 4, f. 7.

Length up to 40 mm. Mantle tough. Back smooth or minutely granular. Branchial plumes 5, tripinnate. Head small, orals ridge-like. General body-colour dull red dorsally, yellow ventrally; specimens may be cream or orange. Rhinophores and branchiae brown.

Locality: Portarlington, Flinders

Station: Rather common, under stones between tides.

DENDRODORIS NIGRA (Stimpson)

Doris nigra Stimpson, 1855, *Proc. Acad. N.Sc., Philad.*, 7, p. 380.

Length up to 55 mm.; bath smooth, with a few indistinct large blisters. Branchiae 6-8, very large and bushy, quadripinnate. Colour velvet-black dorsally, lighter ventrally. Mantle, foot and orals outlined with crimson. Rhinophores grey, tipped with red; branchiae grey outlined with white.

Locality: Portarlington (Jan.-Apr., 1954).

Station: Rather uncommon, under stones between tides.

Remarks: During the period mentioned above this species was very common, but since then has not again been collected. *Doriopsis australaensis* Abraham, 1877, p. 243, from N.S.W., is apparently the juvenile of this species.

DENDRODORIS STAMINEA (Basedow & Hedley)

Archidoris staminea Basedow & Hedley, 1905, *Trans. Roy. Soc., S. Aust.*, 29, p. 151, pl. 6, f. 3-4.

Length up to 22 mm. Mantle covered with very numerous small tubercular elevations and depressions; to the touch rather like medium sandpaper. Underside of mantle with the distinctive "vein-like threadlets" of the type description. Rhinophores clavate, retractile, laminated. Branchiae 5, small, tripinnate, retractile. Orals rounded rather like leaves. General body-colour yellow or white, occasionally streaked with red. Rhinophores and branchiae brown or yellow.

Locality: Portarlington; Flinders.

Station: Common, under stones between tides.

Remarks: This species was originally described as *Archidoris*, and as there is no radula mentioned I assume that the species was placed there only by external features. Upon dissection of specimens I find there is no radula, which places the species in *Dendrodoris*.

DENDRODORIS ALBOPURPURA, sp. nov.
(Pl. III, fig. 3, 12)

Length up to 75 mm. Back covered by numerous large, flat, blister-like postules. Rhinophores large, retractile, with 12 laminae; clavus at right-angles to stalk. Branchiae 5, large and bushy, tri-pinnate. Foot narrower in front than behind. Head small; orals ridge-like as usual. General body-colour dirty white (pale grey); each blister-like pustule capped with a purple spot. A few brown spots, each surrounded by a white area, are scattered over the median part of the back. Underside of mantle and sides of foot scattered with a number of minute brown spots. Clavus of rhinophores purple, stalks white. Branchiae white. General shape when crawling very elongate.

Locality: Flinders

Station: Rare, under stones at extreme low tide.

Remarks: This species has very little adhesion in the foot. Specimens are collected in the swirling water and sand beneath upturned stones. In an aquarium this species is very active. This species differs from the other Victorian species in its larger size, bent rhinophores and lack of adhesion in the foot.

DENDRODORIS DAVISI Allan

Dendrodoris davisi Allan, 1933, *Rec. Aust. Mus.*, 18, No. 9, p. 447, pl. 56, f. 13-14.

Length up to 20 mm. Mantle broad, soft; "densely covered with large, soft, raised pustules, with smaller ones between them" (*Allan*, 1933, p. 447). Branchia large, 5, tripinnate, retractile. Rhinophores large, with 8 laminae, retractile. Head large, orals ridge-like as usual. General body-colour dirty yellow; median part of mantle greenish. Rhinophores and branchiae dirty yellow, sometimes tinged green.

Locality: Portarlington.

Station: Common, under stones near low tide level.

Remarks: The pustules on the back accumulate a brown mucous or sediment, which is particularly noticeable on the median part. This species, except for its softness, would pass as small specimens of *Staurodoris pustulata* Abraham; the pustules on the back are similarly placed and the colours are somewhat the same.

MADRELLA SANGUINEA (Angas)

Janus sanguineus Angas, 1864, *Journ. de Conch.*, 12, p. 63, pl. 6, f. 5.

Up to 10 mm, long, 3 mm. wide. Aelidiform; head expanded into a semi-circular veil in front, large; foot broad, with 3 grooves in front, tapering sharply behind. Mantle lachrymose in shape, surrounded by 3 or more rows of non-caducous branchial papillae. Papillae fusiform; outer row short and stout; inner row long, some papillae crossing over the dorsum. Rhinophores claviform, upper half surrounded by a single row of closely-set papillae. The whole animal, particularly the papillae, exudes a bright red fluid when irritated. General body-colour blood red as the specific name implies. Radula formula 36 x 1.1.1.

Locality: Torquay (1 spec. Mar., 1956); Breamlea (1 spec. Oct., 1956).

Station: Rare, under stones and crawling on seaweed in rock pools, low tide.

Remarks: This species is also recorded from Japan.

MELIBE AUSTRALIS Angas
(Pl. I, fig. 12)

Melibaea australis Angas, 1864, *Journ. de Conch.*, 12, p. 62, pl. 6, f. 2.

Very small, up to 15 mm. in length. Head expanded into a very large, trumpet-like veil or hood; inner margin lined with a single row of short, stout cirri or tendrils. Rhinophores on long, trumpet-like stalks arising from the hood. Cerata in 4 pairs on back; upper flat end of each pitted with small holes. Dendritic papillae thickly set on median part of back between cerata. Whole body except sole minutely granular. Foot very narrow, sharply pointed in front and behind. Liver-diverticula follicular. Body-colour dirty yellow-cream, cerata dark internally from liver.

Locality: Torquay (2 spec. Oct.-Nov., 1956); Queenscliff (9 spec., Nov., 1956).

Station: Occasionally common, crawling on brown seaweed or under stones.

Remarks: Egg ring small, an incomplete ellipse, diameter 4.5 mm. and 3 mm., depth 3 mm.; eggs white, in a clear gelatinous mass. This species is apparently rare in New South Wales.

MELIBE PELLUCIDA, sp. nov.
(Pl. III, fig. 5-7)

Small, very elongate, length up to 40 mm. Hood very large, notched dorsally and ventrally; cirri arranged on the hood margin in one row, rather long and thin. Cerata in 6 pairs, not easily falling off. No dentritic papillae. Cerata large, about one-quarter of body-length, rather narrow for length, apices pointed; everywhere covered with sharp-pointed tubicles. Foot extremely narrow, rounded in front, pointed behind. Rhinophores large, on very long stalks surmounted by a cup-like shield; between shield and base of stalk, posteriorly, is a delicate but voluminous veil-like membrane, edge of which is minutely serrated; clavus of rhinophores small, with 5-7 laminae. Liver-diverticula flocculent. General body-colour transparent pale yellow or orange, longitudinally lined with bright yellow streaks, everywhere flecked with minute red dashes. Apices of first pair of cerata usually red.

Locality: Torquay (6 spec. Nov.-Dec., 1956).

Station: Uncommon, under stones between tides.

Remarks: In an aquarium, this species is very active, swimming from the bottom to the surface with a graceful exhibition of twisting and turning. The animal swims on its side, starting off by lifting its head and tail until they nearly touch; then it thrusts downwards and so lifts its body. This is quickly repeated again and again till the animal has reached the surface or has touched something and adhered to it. From *M. australis* Angas this species differs in being larger, with a greater number of cerata, and lack of dentritic papillae on dorsal surface.

HERVIA ORNATO (Angas)

Flabellina ornata Angas, 1864, *Journ. de Conch.*, 12, p. 67, pl. 6, f. 7.

Length up to 22 mm. Rhinophores with 9 rings; cephalic tentacles linear. Body shape acolidiform. Branchial papillae in 9-10 groups on either side, in a double row in the first three groups. There are 18 papillae in the first group, about 15 in the second, about 12 in the third to fifth, thus decreasing in number backwards; on horseshoes in the anterior groups, the rest on mere oblique rows. Penis large, transparent light blue, narrow at base, becoming very broad and tapering slightly to a rounded end, on which is a nipple-like protuberance; a minute yellow tube passes through the penis to the nipple. Branchial papillae rather stout, pointed, very dark internally, extenally flecked with orange, red, brown, yellow, green and blue. Foot corners broadly tentaculiform. Body-colour usually orange or yellow flecked with fawn or white. The multi-coloured papillae are very distinctive.

Locality: Torquay; Breamlea; Blanket Bay; Sutherlands Bay, Phillip Island.

Station: Common, under stones and crawling on weed between tides.

Remarks: Egg ring consists of 4 flat concentric rings of pink eggs, 8 mm. diameter. From the following species, this is larger, with a greater number of branchial papillae; the rhinophores are annular in form and the colouring is brighter.

This species and the next, although originally described as *Flabellina* Cuvier, 1830, are here placed in *Hervia* Bergh, 1871, as the positioning of the branchial papillae are better suited for this genus

HERVIA NEWCOMBI (Angas)

Flabellina newcombi Angas, 1864, *Journ. de Conch.*, 12, p. 68, pl. 6, f. 8.

Length up to 15 mm. Rhinophores with 4 encircling rings of nodular papillae; cephalic tentacles stouter than the above species. Branchial papillae in 4-5 groups on either side, first 2 groups set on horseshoes, rest on oblique rows. About 12 papillae in the first group, 10 in the second. Branchial papillae stout, apices rounded; extremely dark internally (greenish-black), externally devoid of colour. Foot corners narrowly tentaculiform. Body-colour pale green maculated with cream.

Locality: Portarlington, Breamlea, Flinders.

Station: Rather rare, under stones at low tide.

(?) HERVIA PEONICIA, sp. nov.

(Pl. II, fig. 7-10)

Length up to 23 mm., extremely narrow. Rhinophores smooth on leading edge, with 8-12 rows of small nodules on the posterior edge; cephalic tentacles extremely long and narrow. Branchial papillae in 7 groups, four papillae in the first and second, 3 in the third to fifth, 2 in the sixth and one in the seventh. In a single row in each group. Gental oriface below posterior part of first right group. Papillae long, slender, apices, acutely pointed; nearly transparent. Foot-corners very narrowly tentaculiform; foot narrow, grooved. Body-colour pale mauve, with two bright purple patches in front of the rhinophores. Rhinophore base mauve, nodules light green, apex yellow. Papillae bright transparent red tipped with yellow.

Locality: Breamlea (type locality, 4 spec. Oct., 1956); Portarlington (5 spec. Oct., 1956).

Station: Occasionally common; crawling on seaweed in pools at Breamlea; under stones between tide levels at Portarlington.

Remarks: From *H. onata* and *H. newcombi*, this species differs in being very narrow, the small number of slender papillae and the arrangement of the papillae along either side Provisionally placed in *Hervia* till a better genus can be found.

In conclusion, I wish to thank Miss J. H. Macpherson, Miss Joyce Allan, and Mr. B. C. Cotton and others for assistance with material, literature, notes, etc.

REFERENCES

Allan, J., 1932. *Aust. Zool.*, Vol. 7, pt. 6.
———, 1932-1933. *Rec. Aust. Mus.*, Vol. 18, Nos. 6-9.
———, 1947. *Rec. Aust. Mus.*, Vol. 21, No. 8.
Angas, G. F., 1864. *Journ. de Conch.*, Vol. 12.
Baba, K., 1949. *Opisthobranchia of Sagami Bay* (Tokyo).
———, 1955. *Opisthobranchia of Sagami Bay* (Tokyo).
Basedow, H., & Hedley, C., 1905. *Trans. Roy. Soc. S. Aust.*
Bergh, R., 1871-1905, *Reis. im. Arch. der Phil.*: *Malacologische Untersuchungen.*
———, 1884. *Report Sci. Res.*, "Challenger," *Zool.*, Vol. 10.
Hedley, C., 1905. *Proc. Linn. Soc., N.S.W.* Vol. 30, p. 4.
———, 1923. *Proc. Linn. Soc., N.S.W.* Vol. 48, pt. 3.

EXPLANATION OF PLATES

Plate I.

1. *Praegliscita chrysoderma* (Angas)—dorsal view with branchiae closed.
2. „ „ „ —ventral view of anterior part.
3. „ „ „ —half row of radula.
4. „ „ „ —rhinophore.
5. „ „ „ —detail of open branchiae.
6. *Thordisa sabulosa*, sp. nov. —dorsal view.
7. „ „ „ —ventral view of anterior part.
8. „ „ „ —half row of radula.
9. „ „ „ —rhinophore.
10. *Glossodoris alternata*, sp. nov. —dorsal view.
11. „ „ „ —ventral view.
12. *Melibe australis* Angas —dorsal view

—Del. R. Burn.

Plate II.

1. *Euphurus multidigitalis*, sp. nov. —dorsal view.
2. „ „ „ —ventral view.
3. „ „ „ —detail of pallial ridge.
4. „ „ „ —rhinophore.
5. „ „ „ —detail of pustules on dorsum.
6. „ „ „ —branchial plumes.
7. (?) *Hervia peonicia*, sp. nov. —dorsal view.
8. „ „ „ „ —ventral view.
9. „ „ „ „ —rhinophore.
10. „ „ „ „ —branchial papillae first right group.
11. *Glossodoris tasmaniensis* (Bergh) —dorsal view.
12. „ „ „ —ventral view.
13. *Nembrotha arnoldi*, sp. nov. —right lateral view.
14. „ „ „ —ventral view of anterior part.

—Del. R. Burn.

Plate III.

1. *Glossodoris perplexa*, sp. nov. —dorsal aspect.
2. *Glossodoris haliclona*, sp. nov. —dorsal aspect.
3. *Dendrodoris albopurpura*, sp. nov.—dorsal aspect.
4. *Glossodoris victoriae*, sp. nov. —dorsal aspect.
5. *Melibe pellucida, sp. nov.* —right lateral aspect.
6. „ „ „ —detail of rhinophore.
7. „ „ „ —detail of cerata.
8. *Cyerce nigra pallens*, subsp. nov. —upper side of lamina.
9. „ „ „ „ „ —reverse side of lamina.
10. „ „ „ „ „ —liver ramifications.
11. „ „ „ „ „ —ventral view of anterior part.
12. *Dendrodoris albopurpura*, sp. nov.—detail of rhinophore.

—Del. R. Burn.

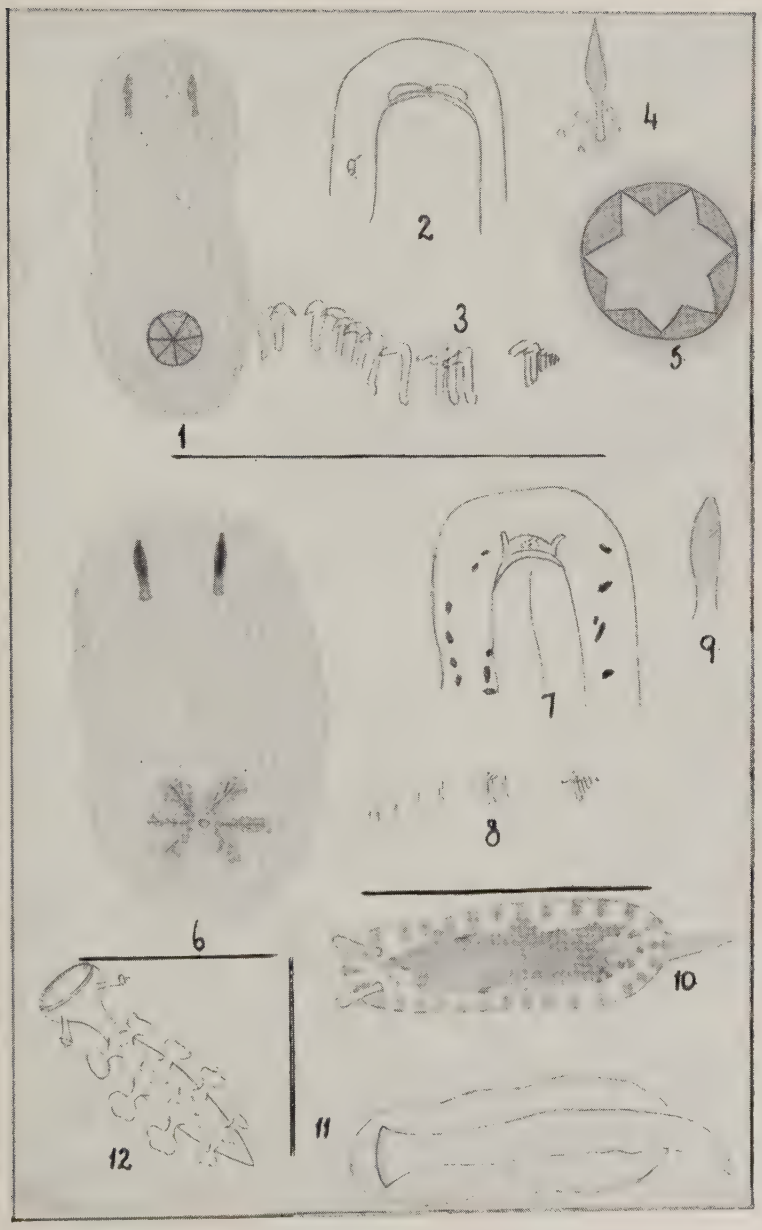


Plate 1.

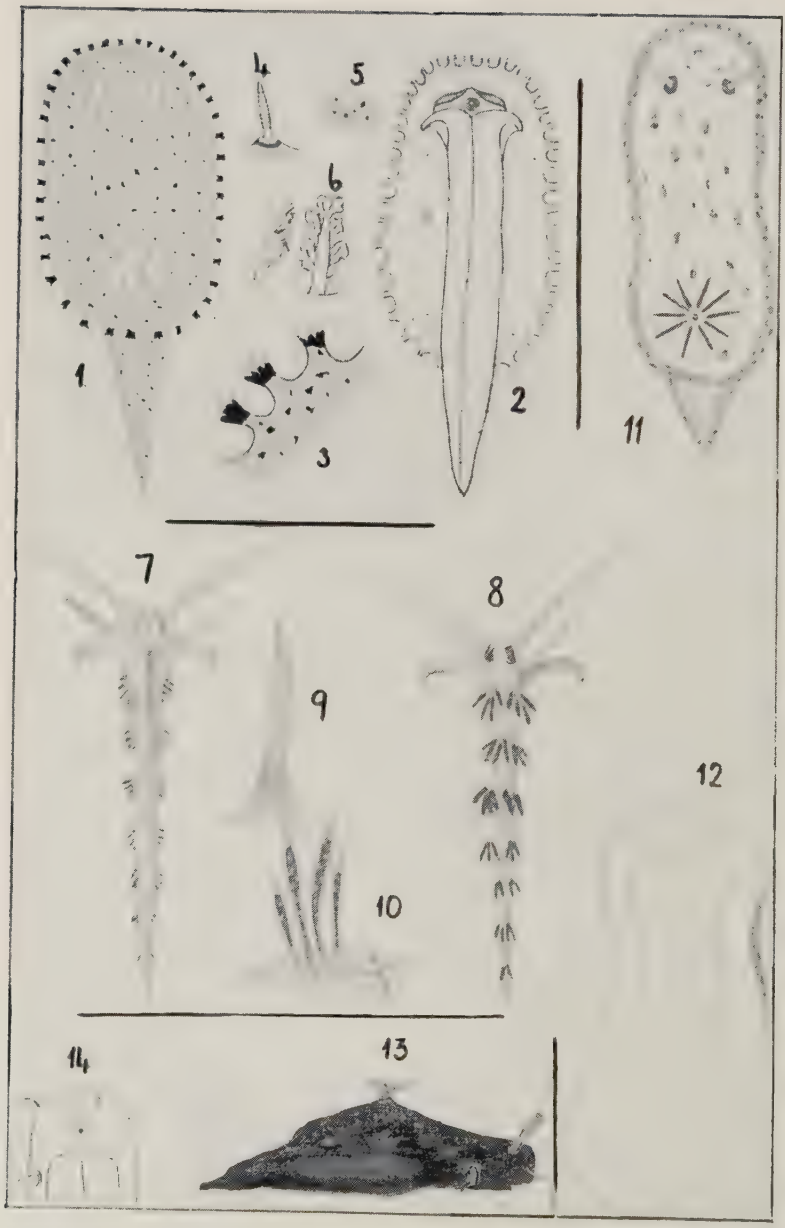


Plate 2.

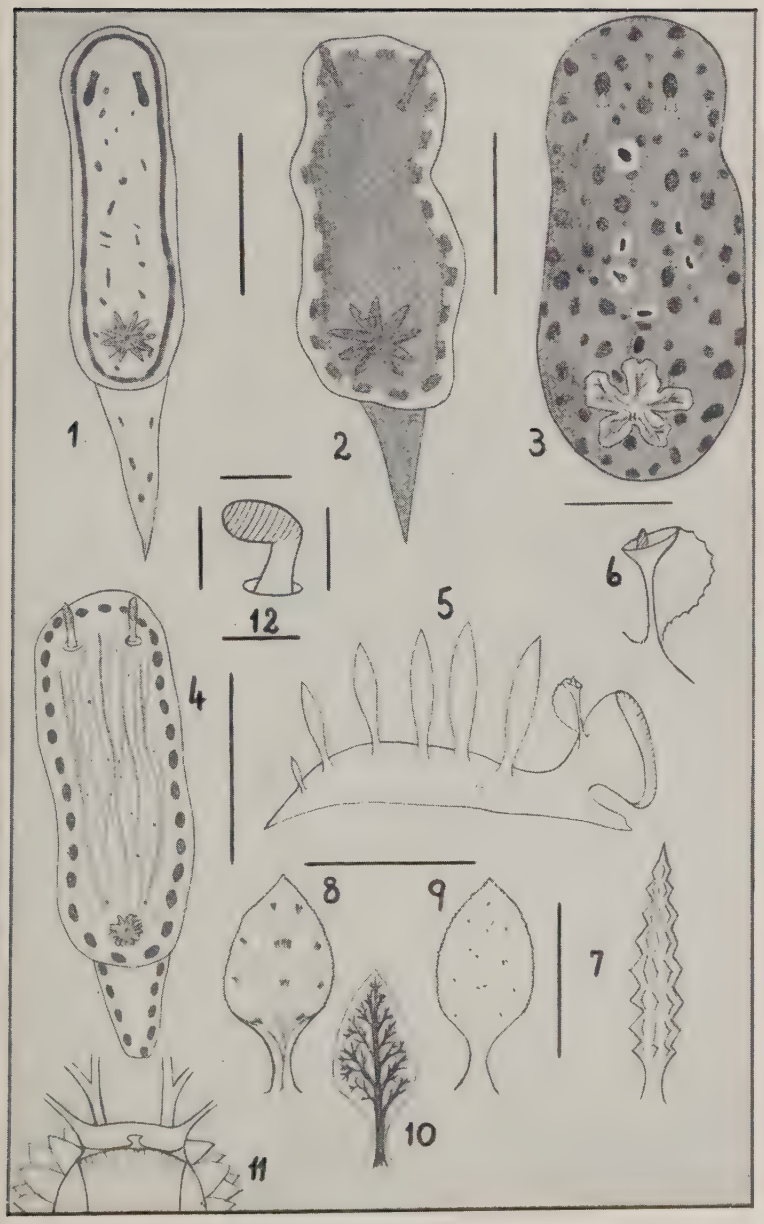


Plate 3.

A NEW SPECIES OF THE VOLUTIDAE FROM NORTH AUSTRALIA

By PROF. J. M. OSTERGAARD† and RAY SUMMERS*

AULICINA PERRYI, sp. nov.

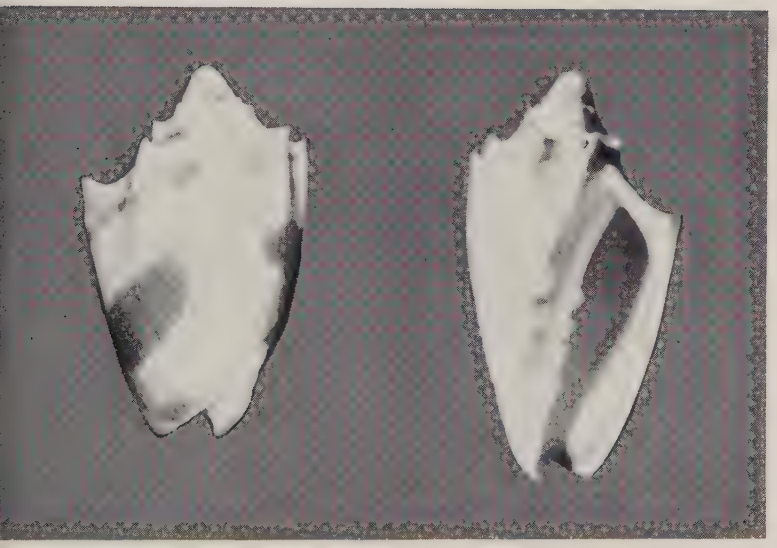
Description: Shell ovately oblong, with rather prominent spire, obtuse at apex and minutely noduled, the nodules increasing in size anteriorly, becoming small sharply-pointed spines on the penult whorl. On the body whorl the spines become prominent, broad at their bases, erect, and very sharp. Whorls smooth, concave on posterior part, but angled where they bear the spines. Columella four-plated, aperture oblong, lip thin, with a narrow zone of pale brown within aperture near margin. Colour of shell white superimposed on a pale carmine ground, with blotches of pale brown, which form an undulating band across the spines of the body whorl. Two large transversely oblong spots of same colour are present near anterior end of body whorl. Brown areas occur on the spire, becoming gradually obscure at the apex. Aperture and columella white.

Size: Length of shell 47 mm., length of aperture 33 mm.

Locality: Queensland, Aust., on Westaria Reef in the Capricorn Group.

Remarks: The holotype is in the collection of Raymond H. Summers, Petaluma, California, U.S.A. The paratype is in the collection of Arthur J. Nash, Gladstone, Queensland, Australia, and an immature specimen is in the collection of Roy Perry, Gladstone, Queensland, Australia, the gentleman who collected all three specimens and generously presented the co-author with a specimen. According to observations made by the discoverer, Roy Perry, after whom this shell is named, the mantle of the animal was of a "greater percentage of yellow in its outer fringe than is present in *Voluta pulchra* Sowerby." Three known specimens were collected alive in March, 1953. This species seems to be most nearly related to *V. pulchra* Sowerby, with which it agrees quite closely in form and sculpturing, but from which it deviates greatly in colour pattern, lacking the ornamental design of *V. pulchra*. Perry and Nash reside in the area where the specimens were taken and have collected for a number of years without seeing any other examples of the new species.

† Atherton, Calif., U.S.A. * Petaluma, Calif., U.S.A.



Aulicina Perryi, sp. nov.

VALIDITY OF THE GENUS EXOHALIOTIS

By ROBERT R. TALMADGE*

Since the description of the Genus *Haliotis* by Linnaeus in the tenth edition of the *Systema Naturae* in 1758, there have been a number of proposed subdivisions. De Montfort, 1810, noting that no type had been designated by Linnaeus, utilized the Linnaean species *Haliotis asinina* as the type. As far as could be determined, all of the names covering the divisions of the genus have been based upon shell features alone, with little work on the anatomy. The only works noted on the soft parts dealt chiefly with biological projects, with little concerning the taxonomy.

The writer, while engaged in a systematic study of this marine family, had utilized the soft parts in checking the status of various species and subspecies. This led to the accumulation of the soft parts of a number of named genera and subgenera. The portion of the animal found most useful for rapid and accurate separation was the fleshy epipode encircling the muscular foot of the animal.

In most Haliotids, this epipode was of various widths and concave, with an upper and lower rim. These rims might be serrate, palmate, lobed, and with various forms of projections (processes). The concave portion might be smooth, granular papilose, papilae on papilae, or even processed with either single or multibranching projections. Thus it was easy to note the species separations, as seldom did two species have similar forms of the epipode. If so, the shells were distinct and separation carried out by that means. Thus, one worked with a combination of shell and animal.

It was rather interesting to find that a more or less common Australian species had an epipode that was separable from any other species examined. The South Australian and western Victorian species, *Haliotis cyclobates* Peron, 1816, had a narrow or singular rim-like epipode that was frilled with fine, more or less even processes. Perhaps a better description and comparison might be stated thus. Most of the *Haliotis* have a double-rimmed epipode with a concave area between the rims; whereas in the *Haliotis cyclobates* this is restricted to a single rim, without the concave area.

Cotton and Godfrey, in the *South Australian Naturalist*, Vol. XV, p. 16, Nov., 1933, proposed the subgenus *Exohaliotis*, with the *Haliotis cyclobates* as the type. Their diagnosis is as follows: "*Exohaliotis* (subgen. nov) shell subcircular, very convex, spire subcentral and comparatively extremely elevated; spirally lirate and radiately folded. Type *H. cyclobates* Peron." On pages 19 and 20 of this same publication further discussion as to size, range in depth and area, and coloration was carried out. Kangaroo Island was given as the type locality.

With such distinctive shell features found in no other *Haliotis*, and with animal that is also separable from any other *Haliotis*, it appears that the status of a full genus for the *Exohaliotis* is validated.

Appreciation for anatomical parts is given to Mr. George Pattison of Glenelg, South Australia, and to Miss Macpherson of the National Museum of Victoria, in Melbourne.

* Willow Creek, Calif., U.S.A.

BOTHRIEMBRYON BARRETTI DISCARDS ITS EPIPHRAGM

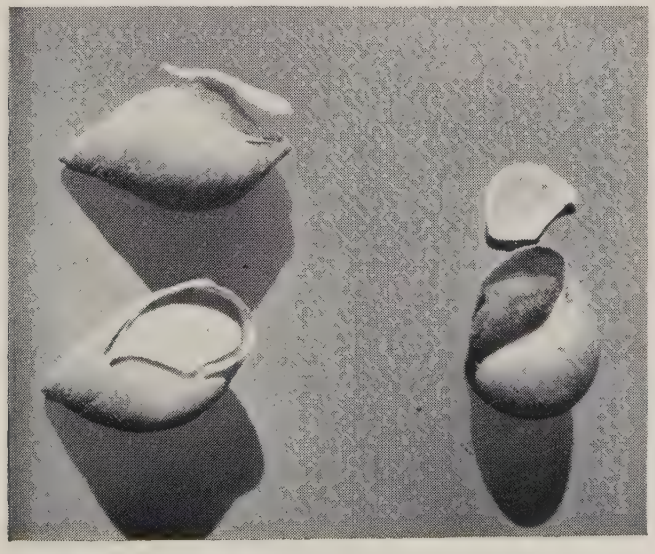
BOTHRIEMBRYON BARRETTI Iredale 1930

By THELMA HARTLEY*

This one inch long native Australian land snail belongs to the peculiar family Bothriembryontidae so well developed in South-Western Australia. It is one of over thirty species of the genus, and it is named after the great Victorian Naturalist, Charles Barrett. A few living and dead specimens were taken by myself on a recent expedition to Western Australia, between Madura and Cocklebiddy in the Nullabor Plains, on 18th September, 1956.

An interesting fact is that I found operculum-like objects of thin white calcerous structure, literally covering the ground for about three feet underneath nearly every bush. The living snails had the "operculum" stuck to the foot on an area no larger than a pin's head, and it moved in and out with the foot almost like a true operculum. There are no operculate land snails in Southern Australia, so that the white objects proved to be epiphragms about to be and already dispensed with.

Colour slides were taken of this extraordinary occurrence and black and white photographs made from them of the shells and epiphragm are reproduced here.



Bothriembryon barretti Iredale, with epiphragm.
Nullabor Plains. 18th Sept., 1956.

* Melbourne, Australia.

EXISTING BEDS OF THE BIVALVE ANADARA TRAPEZIA Deshayes 1840 IN WESTERNPORT BAY, VICTORIA

By R. J. PLANT*

One of the shells to be found in great quantity lying dead on the more sheltered beaches of South-Eastern Australia is that of the Ark *Anadara trapezia*. The shell is thick and trapeziform, with radiating ribs about twenty-six in number, and has a dark brown rather scaly periostracum. The hinge bears a number of small ventral teeth in an unbroken series. Fully matured specimens reach three inches in length.

Although quite common in tidal flats from southern Queensland to New South Wales, in Victoria only a few living specimens have been taken over the past few years. In South Australia it is subfossil, having died out in the Middle Recent times. Therefore, it is interesting to record the location of some quite extensive beds near Rhyll, a small fishing village on Phillip Island, in Westernport Bay.

During the year 1956 a regular scrutiny of the tide lines in this locality, where dead valves are found in great quantity, produced one living specimen, and from this evidence and careful questioning of a reliable local fisherman, an attempt was planned to find beds of the *Anadara trapezia* which it was thought could still exist in the bay. The best indication of possible location was a statement by the fisherman that he had felt the contact of heavy shells against his legs when hauling nets on certain parts of the mud flats, and of course this narrowed the search down considerably, as the mud flats in this area cover many square miles and the task of searching them would have been very slow.

Conditions for searching are very difficult, as the mud is thick and black, and varies from a depth of thirty inches to four feet in a matter of yards. At first only a few living specimens were found, but further work resulted in the discovery of the first of the large beds, which appeared to cover about half an acre. Since this observation, much larger beds have been found, and they would cover much larger areas. These molluscs do not appear to keep company with any other molluscs, and they live close together as the dominant species on the beds. Not more than a few inches separate one from the other, the whole bed of them surfaces quite regularly at low tide, but may be as far as 18 inches down in the mud at times.

As the most logical explanation for the sudden disappearance of the *Anadara trapezia* from southern Australian waters would be a sudden variation of temperature, it is well to note how sheltered these beds are from the colder ocean waters, and, although further south than the neighbouring State of South Australia, the waters of this bay are comparatively warm. The depth of this section of Westernport is never greater than 2 fathoms, and an average rise and fall of tide from 7 to 8 feet keeps the average temperature over the year at approximately 58 degrees. During the coldest of winter months this does not fall below 54 degrees and reaches 69 degrees at times during the summer period.

* Cowes, Port Phillip Island, Victoria, Australia.

The beds have remained undisturbed for probably over a century, as they are not taken by the local fisherman for bait or any other purpose. There is, however, evidence that aborigines on Phillip Island did take them for food, as some of the cooking middens still show remains of fire-blackened valves. There is not likely to be any interest taken in the *Anadara trapezia* because of the red blood of the animal, which discourages any persons who may have thoughts of taking them for food, as the appearance is not attractive.

The interesting sequel to the location of these beds is that an attempt is at present being made to re-introduce the living mollusc into part of South Australia. According to information available from that State, it is evident that at one time large beds of *Anadara trapezia* flourished at Port Wakefield, near Adelaide (Cotton 1957), and therefore it was decided to make an attempt to transfer some living specimens from Westernport to Adelaide (a distance of some 600 miles). Their passage was carefully arranged, and some 50 living specimens of various size and age were selected and despatched by air to that city, where they arrived less than 24 hours after being taken from the sea at Rhyll. Some of these specimens were handed to the University of Adelaide, and the remainder were placed in the sea in suitable conditions, near Semaphore, in the Gulf St. Vincent, where their career is being watched with interest.

As conditions and water temperatures are similar to those in Westernport Bay, it is hoped that the experiment may be successful; however, it will be some months before any indication can be given as to whether this will be so.

Existing beds of the Bivalve *Anadara trapezia* (Deshayes 1840) in Westernport Bay, Vic.

A SPECIES OF FERUSSACIA IN SOUTH AUSTRALIA

By L. A. W. C. VENMANS,* Ph.D.

Since Quoy and Gaimard, in 1824, published the first record of European slugs (*Limax maurus* = *Milax gagates* and *Limax megalodontes* = *Limax flavus*) in South Australia, several authors have recorded new intruders.

In his Presidential Address, delivered at the annual meeting of the Malacological Society of London, 9th February, 1952, Dr. H. E. Quick gave a survey of the literature on that subject and published a list of fifteen western European land molluscs introduced into Australia and Tasmania.

In 1954 B. C. Cotton published his Catalogue of the introduced snails and slugs in Australia, and mentions 35 species, most of which inhabit the Mediterranean and western European areas.

Dr. H. E. Quick kindly sent me some specimens of one of these adventive molluscs collected in the summer of 1953 by Mr. B. C. Cotton, who, later on, was good enough to send me some more material.

The species was first seen in great numbers during July and August of that year at Verdale Avenue, Linden Park, an eastern suburb of Adelaide, within four miles of the centre of the city. They were in very damp places, under the bricks, old cement bags, etc., on a block of land on which the foundations and walls of a new house had been built. The animals were active, apparently prolific, and, if disturbed, rapidly moved from light to seclusion.

In January of the same year the undergrowth of the building block was burnt off; only a few small olive trees, so common in the district, where they were originally introduced some hundred years ago by early colonists, probably from Italy, were growing there, and at the time of the find a thick growth of grass covered the ground without any unusual weed. No clue could be found as to how the snails came there. Mr. Cotton assures me that only locally-made cement, bricks, steel window frames and no imported materials have been brought to the blocks, so that it seems most likely that some specimens of this small species, like several other Mediterranean species, which have been imported into Australia from time to time, were introduced with trees or plants. If they were imported with the olive trees growing there, they must have lived and multiplied on a quarter of an acre since early times, and been overlooked until the summer of 1953, which possibility is hardly acceptable. There are no records of the species from other localities in Australia, and since then the snails disappeared from the scene as suddenly as they turned up.

It is quite certain that the specimens from South Australia belong to the genus *Ferussacia* Risso, 1826, *sensu stricto*. According to Cotton (1954, p. 185), H. E. Quick, after examining some specimens of the lot, came to the same conclusion, and Cotton (1954, p. 184) described the species under the name of *Ferussacia folliculus* (Gronovius, 1781).

I am, however, not convinced that the specimens, a number of which are listed in my collection under No. 7372, belong to the true *Ferussacia folliculus* (Gron.) because they seem to differ from a number of specimens described as such in many respects.

Numerous forms of the genus *Ferussacia* Risso, 1826, are known from the Mediterranean area, as well as from the European and African main-

* Moergestal, Netherlands.

lands, and from the Canaries, Madeira and other western Mediterranean islands. Thiele (1931, pp. 547 and 548) divided the genus into five subgenera, and the subgenus *Ferussacia* s.s., to which our specimens belong, into two sections: *Ferussacia* s.s., of which the type species is *Ferussacia gronoviana* Risso, and of which representatives are indigenous in the Mediterranean area and on the Canary Islands, and the section *Pegea* Risso, 1826, which is limited to North Africa only, and of which the type species is *Ferussacia* (Pegea) *carnea* (Risso).

Because of the form of the shell, the shape of the aperture and the armament of the columella, the South Australian specimens have to be classed in the first-named section, to which also the species *Ferussacia folliculus* (Gron.) belongs.

Even of the section *Ferussacia* s.s. many forms have been described, but there is, however, such a great variability in shape and measurements of the shells, even in the same species, that it seems for the present impossible to make out with reliable certainty how many really distinct species there are.

Nevill (1880) pointed out this fact, and after him Watson (1928), Odhner (1931), Soos (1933), Wachtler (1935) and several other authors came to the same conclusion.

To form an idea of the variability of the representatives of the genus I give here a list of some allied species with their mean measurements and indices, as mentioned by some of the principal authors.

	Height of Shell in mm.	Maj. Diam. of Shell in mm.	Index
F. folliculus (Germain, 1930)	8–9	2.75–3	33–34
(Odhner, 1931)	10.5	3.6	34
	10.0	3.7	37
	9.0	3.0	33
	9.0	3.6	40
F. vescoi (Soos, 1933)	8.4	3.2	38
	9.1	3.3	36
	10.1	3.6	36
(Germaine, 1930)	9.0	4.0	44
F. abromia (Germaine, 1930)	11.0	4.0	36
(Bourguignat, 1864)	11.0	3.5	32
F. amblya (Nevill, 1880)	8.5	4.0	47
F. barclayi (Pfeiffer, 1855)	9.0	4.0	44
(Pilsbry, 1908)	8.6	3.5	41
	10.0	4.0	40
	8.3	3.5	42
F. gronoviana (Germain, 1930)	7.0	3.25	46
(Nevill, 1880)	10.0	3.75	38
	9.0	3.75	42
F. gronoviana f. *subamblya* (Nevill, 1880)	8.25	3.3	40
F. gronoviana f. *subfolliculus* (Nevill, 1880)	9.0	3.5	39
F. gronoviana f. *subforbesi* (Nevill, 1880)	8.25	3.25	39
	8.5	3.5	41
	7.75	3.0	39

The measurements of the South Australian specimens are as follows:—

Height in mm.	Maj. Diam. in mm.	Number of Whorls	Index
9.0	3.7	$5\frac{3}{4}$	41
9.0	3.7	$5\frac{3}{4}$	41
9.0	3.6	$5\frac{3}{4}$	40
8.6	3.8	$5\frac{3}{4}$	44
8.6	3.7	$5\frac{3}{4}$	43

On account of the circumstances mentioned above, and of the great uncertainty concerning the boundaries between the diverse species, varieties and races, it is for the present quite impracticable even to make an attempt to come to a conclusion regarding the identity of the very few specimens available from South Australia.

Though this is also the opinion of Dr. E. H. Madge, Director of the Victoria Hospital at Quatre Bornes, Mauritius, who kindly compared my specimens with as many lots of *Ferussacia* as he could find in the British Museum in London, and also of Dr. G. Ranson, Vice-Director of the Malacological Museum in Paris, who compared them with the lots of *Ferussacia* in the Paris Museum, I will refer to the following facts:—

In the middle of the nineteenth century Sir D. Barclay found in the Isle of France (Mauritius) a species, which Pfeiffer (1855), in honour of the discoverer, described under the name *Spiraxis barclayi*.

Nevill also found the species even before 1870, for Semper mentions in that part of his *Reisen im Archipel der Philippinen*, which was published in that year, that he received from Nevill a shell under the name of *Glandina vericulata* Benson, which Pilsbry (1908, p. 233) asserts to be a synonym of *Ferussacia barclayi*. Semper, however, did not say where the specimen was found, but he gives a not very detailed description of the jaw and the radula, without figuring the shell or the described organs.

In visiting Mauritius in 1878, Nevill came again upon specimens of the same species, and even found a sinistral example. According to Pilsbry (1908, p. 233), who first figured the species, it appeared to belong to the genus *Ferussacia*, and was probably an introduction from southern France. It differs from *Ferussacia folliculus* (Gron.) (i) by its slightly more ventricose last whorl, and, in accordance, by its somewhat wider aperture. Pilsbry's figures 66, 67 and 70 agree very well with the majority of our specimens.

It is uncertain whether, at present, the species is still living on Mauritius. Dr. Madge, who made extensive collections on the island, assures me that he has never found it. He compared my specimens also with those found by Nevill on Mauritius and at present in the British Museum, and came to the conclusion that at least four specimens of my lot agree very well with *Glandina vericulata* = *Ferussacia barclayi*. The other specimens agree pretty well with specimens from Spain labelled by Tomlin as *Ferussacia vescoi* (Bourguignat). The Australian specimens are somewhat more bulging

(i) Germain (1930, p. 322) wrongly changed the name to *Ferussacia follicula*. This is incorrect, because *folliculus* is a substantive signifying "a little grain," and not a declinable adjective.

than is generally the case in *Ferussacia folliculus*, and the columella is internally twisted as in *Ferussacia vescoi* and *F. barclayi*.

Mr. Ranson agrees with Dr. Madge as to the first four specimens, but feels sure that the other ones are true *Ferussacia folliculus* (Gron.), not *Ferussacia* (Bourg.), which he thinks to be a true species and not a variety of *F. folliculus*. Therefore, it is quite possible that our specimens have not been introduced into South Australia directly from the Mediterranean area, but via the intermediate station of Mauritius.

Even after a thorough anatomical investigation of a number of species neither Moquin-Tandon (1855), who studied the anatomy of *Ferussacia folliculus* (Gron.), nor Godwin Austen (1880), who investigated anatomically *F. gronoviana* Risso, nor Watson (1928), who studied the anatomy of *F. folliculus* (Gron.) and *F. oranenisis* (Bgt.), nor Soos (1933), who dissected *F. vescoi* (Bgt.), nor Wachtler (1935), who investigated the anatomy of *F. folliculus* (Gron.), *F. reissi* (Mart.), *F. lanzarotensis* (Mouss.) and *F. vescoi* (Bgt.) could come with certainty to a reliable conclusion concerning sharp differences between them, though sometimes slight differences between some organs were established.

Probably many of what hitherto have been considered separate species will finally appear to be only ecological forms of one of two true species.

Our final conclusions must be, for the present, that, without a very extended taxonomical, anatomical, biological and ecological comparative investigation, it is as yet impossible to settle the question entirely.

Nevertheless, it seems to me subservient to later investigations, if I record here some of my experiences in dissecting the animals from South Australia.

According to some authors, the skin of the various species of *Ferussacia* seems to have a specific coloration, varying from greyish to yellow or green. However, as they had been in alcohol so long, nothing could be seen of this external coloration or of the pigmentation of the internal organs in my Australian specimens.

As is generally the case in the sub-family, *Ferussaciinae*, the relatively long and small foot shows a well-marked pedal fringe as well as a conspicuous suprapedal grove, and a well-developed mucous pore at a short distance from the caudal end.

The jaw (Fig. 1) is aulocognath, very thin and elastic, and of a yellowish colour. It has a number of narrow, smooth longitudinal folds or ribs, which converge posteriorly, and of which the central ones (about eight) touch each other on an imaginary median line. In the literature I could not find any special note concerning this peculiar course of the folds, though Watson (1928) figures converging striae to a certain extent for *F. oranensis*, and also to a small degree for *F. folliculus*.

According to Watson (1928), the jaw of *F. oranensis* has 48, and of *F. folliculus* only 42 folds. Wachtler (1935), however, counted 48-69 folds in the jaw of *F. folliculus*, whereas he found in *F. vescoi* 48-52, and in *F. reissi* 44 folds. Soos (1933) found in his specimens from the Maltese Islands, which he considered to belong to *F. vescoi*, and of which he states

that the jaw is exactly as in *F. gronoviana*, about 40-50 folds. In our specimens I counted a number of 48, 50 and 64 folds.

Watson (1928) gives for *F. folliculus* a breadth of 0.75 mm., and for *F. oranensis* a breadth of 0.65 mm. The breadth of the jaw in our specimens is about 0.90 mm., and the height in the middle part about 0.30 mm.

I have investigated the radulae of seven specimens, and found the following details:—

Transverse Rows	Formula	Length in mm.	Breadth in mm.
77	25–12–1–12–25	1.6	0.6
88	21–12–1–12–21	1.7	0.5
87	25–12–1–12–25	1.6	0.7
90	26–12–1–12–26	1.6	0.7
87	26–12–1–12–26	1.6	0.6
80	25–12–1–12–25	1.5	0.6
85	25–12–1–12–25	1.7	0.7

The course of the transverse rows is shown in fig. 2.

The central tooth is about the same length as the adjacent teeth on each side of it, but very much narrower, the length being about 0.025 mm. and the breadth about 0.007. At its front edge it bears three small blunt cusps, of which the middle one is slightly longer than the side ones.

The first twelve teeth on either side of the central tooth have well-developed bases provided with three more or less sharply-pointed cusps, of which the middle one is very powerful and much longer than the adjacent side cusps. Towards the outer edges of the radula they diminish in length and breadth; the bases gradually become comparatively more powerful, whereas the cusps diminish in size, the mesocones more rapidly than the side cusps. In the first teeth on either side of the central tooth the middle cusp is about four times as long as the side cusps, in the seventh lateral teeth the mesocone is still three times as long as the side cusps, whereas in the twelfth lateral teeth the ratio is not more than 2: 1.

From about the thirteenth tooth on each side of the rhachis there is a row of very small marginalia, which continue to diminish in size gradually towards the outer edges of the radula, and, apart from the very minute projecting cusps at the base, have the form of small rectangles closely placed side by side.

The central and lateral teeth of the successive transverse rows overlap each other, but towards the outer edges of the radula the overlapping gradually diminishes, so that in the outermost parts the marginals of the successive rows are fully detached.

The genitalia (figs. 4-7) are quite simple.

The albumen gland (about 1.5 mm. long) is rather large at its anterior end and narrowing distally; the hermaphrodite gland consists of a number of small oblong follicles opening into the very narrow hermaphroditic duct, which is at first straight and then slightly convolute in its distal third.

The rather long female left side of the spermoviduct (about 5 mm.) is swollen in most of the specimens, and contains a number of very little

eggs, which increase in size towards the front. The male right side is furnished with a comparatively small, though well developed, prostate gland consisting of a number of single glands.

The vas deferens leaves the spermoviduct at about the same level as the anterior end of the receptacular duct, so that the free oviduct is extremely short. The unbranched receptacular duct is rather broad and long (about 3.5 mm.) and arises from a well-developed oval spermatheca; its anterior third shows a conspicuous widening in the middle.

The vagina is about 1.5 mm. in length and slightly narrowing towards the anterior end, where it passes into a genital atrium of moderate length and diameter.

The vas deferens is long (about 4.5–5 mm.) and narrow throughout its length, though slightly broadening apically; it winds around the vagina and enters the apical part of the penis just below or at the insertion of the penial retractor muscle, which is simple and attached to the dorsal body wall.

The penis is broad and comparatively short, its length being only about 1.5 mm.; it consists of a cylindrical main penis, which is somewhat narrowed, or even strangulated in the middle part, and a small muscular lateral penial appendage. Though in the specimen of fig.5 the penial appendage is directed backwards and in that of fig. 6 it is also directed backwards in some degree, I think that the original direction of the appendage, if fully extended, is forwards. The specimen drawn in figs. 4 and 7 appeared to show the fully extended penial appendage, and this is directed forwards. In the specimens drawn in figs. 5 and 6 the appendage is more or less contracted, and in consequence assumes a more backward position. The specimen of *Ferussacia folliculus* examined by Watson (1928) and drawn in his fig. 10 shows the penial appendage directed sideways and partially invaginated, but I should not be astonished if that peculiar position is due to contraction as well.

REFERENCES

Pfeiffer, L., 1855. Descriptions of Forty-seven New Species of Helicea, from the Collection of H. Cuming, Esq., *Proc. Zool. Soc., Lond.*, 23, pp. 91-101.

Bourguignat, J. R., 1864. Malacologie de l'Algerie, histoire naturelle des animaux Mollusques terrestres et fluviatiles recueillis jusqu'a ce jour dans nos possessions du nord de l'Afrique. Paris.

Semper, C., 1870. Reisen im Archipel der Philippinen. Landmollusken, 3.

Watson, B., 1875. On the Generic Peculiarities of the distinctively Madeiran Achatinae of Lowe. *Proc. Zool. Soc. Lond.*, pp. 677-680.

Watson, B., 1877. Some notes on the Madeiran Mollusk identified by the Rev. R. T. Lowe as *Achatina folliculus* Gron. *Proc. Zool. Soc., Lond.*, pp. 333-334.

Nevill, G., 1880. On the Land-Shells, extinct and living, of the Neighbourhood of Menton (Alpes Maritimes), with Descriptions of the new Genus and of several new Species. *Proc. Zool. Soc., Lond.*, pp. 94-142, pl. XIII and XIV.

Godwin-Austen, H. H., 1880. On the Anatomy of *Ferussacia gronoviana* Risso, from Mentone. Concluding with a Note of the Classification of the Genus and its Allies by Geoffrey Nevill. *Proc. Zool. Soc., Lond.*, pp. 662-666, pl. LXIV.

Bourguignat, J. R., 1883. *Histoire de la Malacologie d'Abyssinie*, Paris.

Pilsbry, H. A., 1908. *Manual of Conchology*, 19.

Watson, H., 1928 The Affinities of Cecilioides and *Ferussacia* illustrating adaptive evolution. *J. Conch.*, 18.

Germain, L., 1930. Mollusques terrestres et fluviatiles. *Faune de France*, nr. 21, Paris.

Odhner, N. H., 1931. Beitrage sur Malakozoologie der Kanarischen Inseln. *Ark. Zool.*, 23a, nr. 14.

Thiele, J., 1931. *Handbuch der Systematischen weichtierkunde*, 1. Jena.

Soos, L., 1933. A systematic and zoogeographical contribution to the Mollusc-Fauna of the Maltese Islands and Lampedusa. *Arch. Naturgesch.* 2, pp. 305-353.

Wachtler, W., 1935. Beitrage zur anatomie der Stylommatophoren Lungen-Schnecken. Ueber die Gattung *Ferussacia* Risso. *Zool. Jb. Abt.*, 1, 67.

Pilsbry, H. A., 1946. Land Molluscs of North America (North of Mexico), 2, part 1. Philadelphia.

Quick, H. E., 1952. Emigrant British Snails *Proc. Malac. Soc.*, 29, pp. 181-189.

Quick, H. E., 1953. Helicellids introduced into Australia. *Proc. Malac. Soc.*, 30, pp. 74-79.

Cotton, B. C., 1954. A Catalogue of Introduced Snails and Slugs in Australia. *Rec. S. Aust. Mus.*, 11, pp. 177-187, pl. 1.

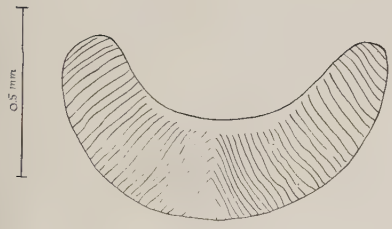


Fig. 1.
Ferussacia sp. from South Australia. Jaw. (Coll. Venmans, Nr. 7372, 2.)

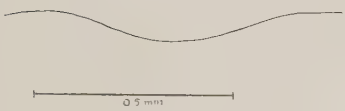


Fig. 2.
Ferussacia sp. from South Australia. Course of the transverse rows of the radula. (Coll. Venmans, Nr. 7372.)

Fig. 3.
Ferussacia sp. from South Australia. Radula, central and first lateral, 7th and 13th teeth. (Coll. Venmans, Nr. 7372.)

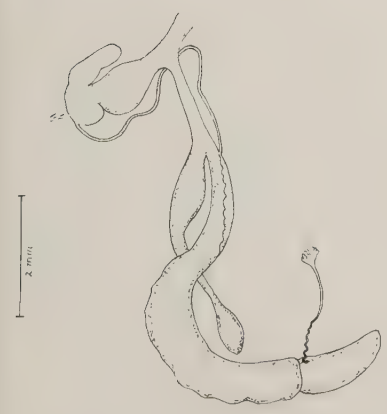


Fig. 4.
Ferussacia sp. from South Australia. Male and female genitalia of one of the specimens. (Coll. Venmans, Nr. 7372, 1.)

Fig. 5.
Ferussacia sp. from South Australia. Male and female genitalia of one of the specimens. (Coll. Venmans, Nr. 7372, 2.)

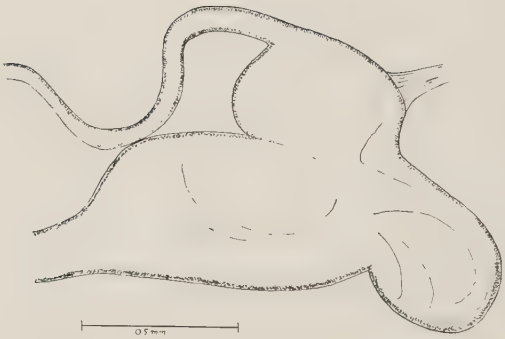


Fig. 6.
Ferussacia sp. from South Australia. Penis of one of the specimens. (Coll. Venmans, Nr. 7372, 3.)

Fig. 7.
Ferussacia sp. from South Australia. Penis of the same specimen as Fig. 4, strongly enlarged. The cavity of the penial appendix is seen through the transparent wall. (Coll. Venmans, Nr. 7372, 1.)

MAGNIFICENT SPECIMENS FROM NEW SOUTH WALES

SEMICASSIS ANGASI Iredale

By THELMA HARTLEY*

Cassidea angasi Brazier, 1911. Shirley, *Proc. Roy. Soc. Q'land*, 23, p. 98.

Xenogalea angasi Iredale, 1927. *Rec. Austr. Mus.*, 15, p. 350, pl. 32, fig. 15.

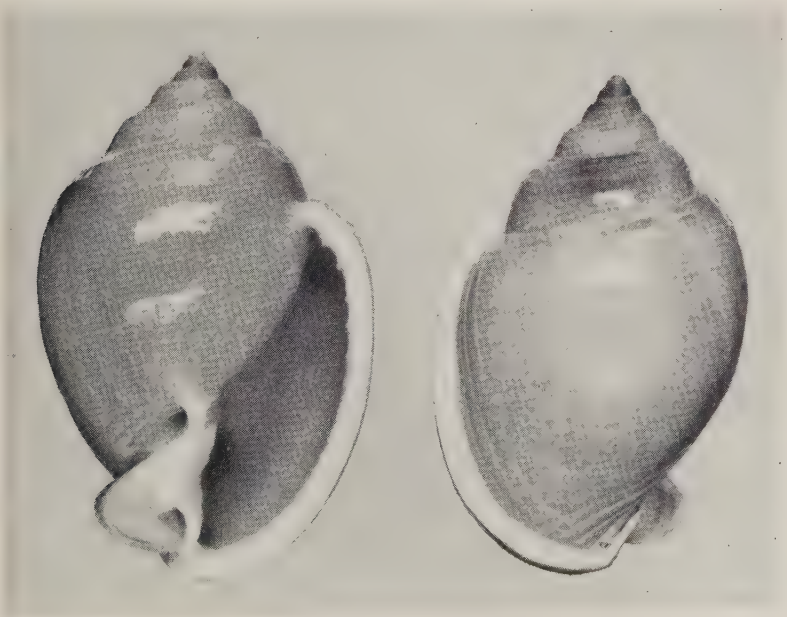
Iredale, in 1927, figured and described the species *Cassidea angasi*, Brazier's specific name being a *nomen nudum*.

Two magnificent specimens of this rare species taken at Evans Head, New South Wales, in 12 fathoms during September, 1956, have come into my possession. The larger measures, height 49 mm., width 31 mm., and they are figured here.

Close examination reveals that *angasi* has affinity with *Semicassis* rather than *Xenogalea* as introduced by Iredale.

The denticulate outer lip, apertural features and spaced spiral lirae show relationship to *Cassis japonica* Reeve, the type species of *Semicassis* Morch, 1852, rather than with *Cassis pyrum* Lamarck, the type species of *Xenogalea* Iredale, 1927.

I have to thank Mr. Bernard C. Cotton, Curator of Molluscs, South Australian Museum, for helping me with this short paper and supplying the illustrations.



Semicassis angasi Iredale.

* Melbourne, Australia.

ON SOME VICTORIAN CEPHALOPODS

By ROBERT BURN*

(Read 25th February, 1957)

The Victorian list of cephalopod mollusca is not very extensive, very little work having been done on the matter. During the last few years I have collected a number of shallow water forms, among which were 3 species not previously recorded from Victoria. I therefore take this opportunity to record and briefly describe the following 2 species of squid, and one species of octopus.

IDIOSEPIUS NOTOIDES Berry

Idiosepius notoides Berry, 1921, *Rec. S. Aust. Mus.*, 1, No. 4, p. 361. Very small, up to 35 mm. in length, cylindrical body, bluntly rounded behind. Fins small, semi-circular, about one-third as long as body; situated very close to the posterior end. Head separated from body mantle, nearly as wide as body. Tentacles short, about one-third body length. Arms very small and stout. Colour light brown to light grey, in each case with a number of black spots.

Localities: Altona, Portarlington, Swan Bay. (All localities are in Port Phillip Bay.)

Station: Among seaweeds in shallow water.

This is the first record of this species other than from the type locality (Goolwa, South Australia).

EUPRYMNA STENODACTYLA (Grant)

Sepiola stenodactyla Grant, 1833, *Trans. Zool. Soc.*, 1, p. 84, pl. 2. Small, up to 60 mm. long; body broad, rather flat, broadly rounded behind. Fins large, oval in shape, nearly half as long as body, situated midway along body. Head continuous from body mantle, nearly as wide as body. Tentacles nearly as long as body. Arms shorter than tentacles; one is always curled up on the head and is in appearance rather like a ram's horn. Colour grey, profusely spotted with black.

Locality: Portarlington.

Station: Rather common in shallow water.

HAPALACHLAENA MACULOSA (Hoyle)

Octopus maculosa Hoyle, 1883, *Proc. Royal Soc. Edinb.*, 1, No. 7. Small, up to 100 mm. in length; body between one-third and one-quarter of the total length. Arms stout, with 2 rows of suckers. Body terminated in a small, nipple-like protuberance; this feature is more noticeable in preserved specimens. Colour very bright; ground colour bright orange or yellow, arms with blue and brown rings and markings; head and body maculated with similar coloured patches.

Localities: Victorian coastline generally.

Station: Very common under stones, low tide.

---

* Geelong, Victoria, Australia.

TASMANIAN INTERTIDAL MOLLUSCA

By RON. C. KERSHAW*

(Abstract)

Study of the Tasmanian Mollusca reveals several aspects of species constitution, of affinity, and ecology, which seems to support the conclusions of other workers dealing with general ecology and with relationships. Thus the mollusca are part of an ecological unit, the basis of which is ecological rather than faunal with affinities for areas of similar latitude probably discernable. The mollusca are also, in general, part of a Southern Australian faunal entity extending to New South Wales and southern Western Australia, yet with individuality, even a note of Neozelanic affinity.

Thus the fauna is identified in this work as a Tasmanian fauna, despite the obvious relationships with the Peronian on the one hand and the Flindersian on the other. In the past, workers have found evidence of these influences which led to the association of East Coast, Tasmania, with the Peronian, and North Coast, Tasmania, with the Flindersian. These ideas are not here denied, rather they are modified. The North Coast has distinct resemblances to the mainland, particularly to Victoria, but it has also strong Tasmanian influences which should not be denied. Collections made on the West Coast suggest that this coast is also Tasmanian in faunal constitution. Thus it is concluded that the features of the faunal constitution on these shores are due more particularly to ecological factors than otherwise. Accordingly, the suggestion made by recent workers that the term "Maugean Region" be extended to include all of Tasmania, as well as Victoria in part, is favoured herein.

Brief reference is made to the migrations of the fauna in relation to Bass Strait. The molluscan fauna of various parts of the shore is described. The constitution of the fauna of the various coasts is described, with some general reference to animals other than the mollusca, also found on these shores, which have ecological associations.

Bass Strait is regarded as a faunal "cross-roads" where there are many influences. This should not be overlooked.

(This work, with references, is to be published in full at a later date.—Editor.)

* Honorary Associate in Malacology, Queen Victoria Museum, Launceston, Tasmania.

OBITUARY

Malacologists here and abroad will be grieved to hear of the sudden death of well-known member, Mrs. Leone (Lee) Woolacott, wife of Ray, who died on Sunday, 4th August. Lee was one of the foremost amateur malacologists in Australia, with a remarkable knowledge of the eastern Australia marine forms in particular, gained by being an excellent field worker and collector, who loved to pack her haversack and tramp with husband Ray, a keen fisherman, to many out-of-the-way beaches and rocky reefs. Later she changed more to car trips, and had all arrangements made for an early visit to Bustard Heads, Queensland. She always planned trips well ahead down to the finest detail, and had a much wider expedition to Darwin and down the north-west coast planned which she and her husband intended to do, probably next year. Lee always kept field notes assiduously to accompany any collecting she did, and her collection at her home in Mosman was efficiently kept and recorded, example of her clear mind and methodical approach. She had reached the stage where she could do serious research on it, and several papers have appeared in recent years in publications of the Royal Zoological Society of New South Wales, and a very interesting account of one of her many trips to Barrier Reef, in *Walkabout*, a few years ago.

Lee was for many years President of the Marine Section of the R.Z.S.N.S.W., during which time she inspired members with her enthusiasm and love of shells, and undoubtedly her term did much towards building the section to its present standard. A quite new and most noteworthy achievement was the innovation of a Juniors' and Beginners' Class, which she and her daughter, Mrs. P. Harford, formed jointly to teach the elements of Malacology, using specimens from her own collection as training aids. This was held one hour before the usual monthly shell night. Lee was an Honorary Correspondent of the Australian Museum and attended there regularly about once a week to assist in the shell department, where she was working on a revision of the bivalve collection with the writer until the latter was forced to retire owing to a severe illness; she then carried on her excellent assistance with Dr. McMichael. Everyone will greatly miss her charming, warm and helpful nature and her clear brain, which combined so vividly to give her the great love of life and living for which she was noted.

—Joyce Allan, F.R.Z.S.

LIST OF MEMBERS

(Members are requested to send immediate notice of any change of address to the Honorary Secretary.)

PROF. R. TUCKER ABBOTT, Ph.D., Academy of Natural Sciences, 19th and Parkway, Phil., Pa., U.S.A.
MISS JOYCE ALLAN, F.R.Z.S., 72 Cremorne Road, Cremorne, N.S.W.
MR. A. E. AXON, 127 Eagle Street, Brisbane, Queensland.
MRS. E. F. AYERS, P.O. Box 282, Mackay, Queensland.
MR. R. ALLINGHAM, 97 William Street, Perth, W.A.
MR. RICHARD BRIELL, R.R. 1, Box 141, Lexington Park, Maryland, U.S.A.
MR. L. BLACK, Box 10, Leaton, N.S.W.
MRS. H. M. BIXBY, "Topside," Bolton Landing, New York, U.S.A.
MR. ROBERT BURN, 34 Autumn Street, Geelong West, Victoria.
MR. HUGH D. BELL, Emerald Road, Beaconsfield, Victoria.
MRS. MARY D. BELL, Emerald Road, Beaconsfield, Victoria.
MR. C. E. BARKER, 27 Willcott Street, Mt. Albert, Auckland, N.Z.
MRS. BACON, 22 Studley Road, East Brighton.
MAJOR BACON, 22 Studley Road, East Brighton.
MR. DAVID BAKER, 310 Walsh Street, South Yarra.
MRS. J. BROWN, 61 Buchanan Avenue, North Balwyn.
MRS. W. BODE, 24 Tormay Street, North Balwyn.
MR. W. BODE, 24 Tormay Street, North Balwyn.
MISS NANCY BLOCK, 3 Clapham Road, Oakleigh.
MR. JOHN BATES, Miriam Vale, Queensland.
MR. THOS. BATES, Miriam Vale, Queensland.
MR. LLOYD BERRY, 846 W, 42nd Place, Los Angeles, Cal., U.S.A.
MR. L. CATO, Nepean Highway, Rosebud, Victoria.
MRS. L. CATO, Nepean Highway, Rosebud, Victoria.
MRS. C. B. CROFTON, P.O. Box 214, Bowen, Queensland.
MR. BERNARD C. COTTON, Adelaide Museum, North Terrace, Adelaide, South Australia.
MRS. L. M. CURRY, "Linga-On," Gay Terrace, Caloundra, Queensland.
MRS. H. L. CURNOW, 50 Weeroona Avenue, Parkholme, South Australia.
MR. F. S. COLLIVER, Dept. of Geology, University of Brisbane, Brisbane, Queensland.
MR. R. COBB, 117 Down Street, North Ipswich, Queensland.
MRS. CONROY, P.O. Box 829, Cairns, Queensland.
MR. C. A. CUDDAY, Townsville, Queensland.
MRS. P. W. CRICHTON, "Tranquility," Anderson Road, Upwey.
MR. P. W. CRICHTON, "Tranquility," Anderson Road, Upwey.
MR. C. E. COLLINSON, 5 Villa Street, Heidelberg.
MR. D. DICKSON, c/o Crammond & Dickson, Warrnambool, Victoria.
MRS. W. DAVIES, 34 Stephenson Street, Springvale, Victoria.
MR. W. DAVIES, 34 Stephenson Street, Springvale, Victoria
MRS. RITA EVANS, 23 Agnew Street, Brighton.
MR. W. EVANS, 23 Agnew Street, Brighton.
MRS. M. E. FREAME, 85 Esplanade, Seaholme, W.18.
MR. JACK FERNLEY, P.O. Box 14, Cooktown, Queensland.
MR. F. FAHEY, 153 Windsor Road, Northmead, N.S.W.
MRS. J. A. GRIGG, "Winston," Dalrymple Street, Edgehill, Cairns, Q'land.
MRS. H. M. GOLDSMITH, 21 Grendon Street, North Mackay, Queensland.

MR. B. F. HARDY, 89 Percy Street, Portland, Victoria.
MRS. D. I. HARTLEY, 351 Glenferrie Road, Malvern, Victoria.
MR. D. I. HARTLEY, 351 Glenferrie Road, Malvern, Victoria.
MRS. H. M. HOWARD, Tryphena Great Barrier Island, New Zealand.
MR. R. A. HALL, 9 McCrea Street, Prospect, South Australia.
DR. TADASHIGE HABE, The Amakusa Marine Biological Lab., Kyushu, Japan.
MR. W. G. HANCOCK, 21 Herbert Street, Bowen, Queensland.
MR. R. A. HALEY, 18 Edward Street, Shepparton, Victoria.
MR. J. HOMER, 42 Stawell Street, Coburg, N.13.
MRS. T. HUNT, Marine Parade, Shoreham, Victoria.
MR. T. HUNT, Marine Parade, Shoreham, Victoria.
MRS. A. HANLON, 404 Upper Heidelberg Road, Heidelberg.
MR. A. HANLON, 404 Upper Heidelberg Road, Heidelberg.
MRS. C. A. J. INMAN, 33 Melbourne Avenue, Forrest, Canberra, A.C.T.
MRS. W. KILLOUGH, 36 Clendon Road, Toorak, S.E.2.
MR. C. J. KURTZE, c/o The Museum, Portland, Victoria.
MR. R. C. KERSHAW, "Manorama," Lyetta P.O., West Tamar, Tasmania.
DR. YOSHIO KONDO, c/o The Bishop Museum, Honolulu 17, Hawaii, U.S.A.
MRS. A. LYNDON, 26 Morang Road, Hawthorn.
MR. C. J. LYNDON, 26 Morang Road, Hawthorn.
MR. J. L. LEVY, 5 Rix, Glen Iris.
MISS FLORENCE MURRAY, 13 Gaynor Court, Malvern.
MISS MARJORIE MURRAY, 13 Gaynor Court, Malvern.
MR. R. MACFALL, 630 Greenleaf Avenue, Wilmette, Ill., U.S.A.
MRS. M. MARTIN, Roadknight Street, Lakes Entrance, Victoria.
MR. M. MARTIN, Roadknight Street, Lakes Entrance, Victoria.
MRS. V. MASKIEL, 32 Milberton Street, Burwood.
MR. V. MASKIEL, 32 Milberton Street, Burwood.
MRS. W. McKENZIE, 10 Salem Avenue, East Brighton.
MR. W. McKENZIE, 10 Salem Avenue, East Brighton.
MR. J. A. MARSH, McGregor Street, Rockhampton, Queensland.
MRS. F. H. MORAN, 9 Ottawa Road, Toorak, S.E.2.
DR. F. H. MORAN, 9 Ottawa Road, Toorak, S.E.2.
MRS. E. MORTENSEN, Miriam Vale, N.C. Line, Queensland.
MR. ARTHUR NASH, P.O. Box 46, Gladstone, Queensland.
MRS. H. NEWMAN, P.O. Box 123, Marine Parade, Lakes Entrance, Vic.
MR. A. C. NILSON, 38 Seymour Grove, Camberwell.
MR. A. W. PALFREYMAN, 75 Lansell Road, Toorak, S.E.2.
MRS. J. PLANT, "Shearwater," Cowes, Phillip Island, Victoria.
MR. D. PLANT, "Shearwater," Cowes, Phillip Island, Victoria.
MRS. MAY PRICE, 20 Scott Street, Cairns, Queensland.
MRS. O. J. T. REID, 4 Yuille Street, Brighton.
MR. O. J. T. REID, 4 Yuille Street, Brighton.
MRS. A. READ, 57 Grove Street, Cairns, Queensland.
MR. S. C. RICHARDSON, 16 Brewster Street, Essendon.
MRS. GRACE ROHNOLEBEN, P.O., Pt. Lookout, Strandbroke Is., Q'land.
MISS MARY ROBISON, 41 Grandview Grove, Armadale.
MR. L. ROBISON, 41 Grandview Grove, Armadale.
MRS. C. A. RUMP, c/o P.O., North Mackay, Queensland.
MRS. VICTORIA RUTLAND, 67 Grafton Street, Cairns, Queensland.

MRS. E. B. SCOTT, 520 Station Street, Box Hill.
MR. J. McKENZIE SLOSS, "Leisureland," Rosebud West, Victoria.
MR. H. M. SMITH, 1410 Wayne Street, Sandusky, Ohio, U.S.A.
MRS. ALTHEA SHARPE, Box 344, Lismore, N.S.W.
MR. W. STALLARD, c/o Vacuum Oil Co., Townsville, Queensland.
MRS. O. R. SNYDER, 27 Larnook Street, Armadale.
MR. O. R. SNYDER, 27 Larnook Street, Armadale.
MRS. R. STEPHENS, 6 George Street, North Mackay, Queensland.
MRS. B. SOUTH, 22 Lawrence Street, Blackburn.
MR. B. SOUTH, 22 Lawrence Street, Blackburn.
MRS. LOIS SOURRY, 100 Mann Street, Gosford, N.S.W.
MR. DARCY TONKIN, P.O. Box 92, Minlaton, South Australia.
MRS. VAN HOUSTON, 255 Emporia, Apt. 5, San Antonio, Texas.
MR. H. T. WARD, Box 1285, Agana, Guam, M.I.
MISS NOEL WALKEDEN, William Street, South Yarra.
MR. R. F. WELLSTEAD, 31 Gardinia Road, Gardenvale, Victoria.
MASTER MAX WELLSTEAD, 31 Gardinia Road, Gardenvale, Victoria.
MR. BARRY WILSON, 199 Hensman Road, Subiaco, W.A.

INSTRUCTIONS TO AUTHORS

1. No paper shall be published unless approved by the Editor and Committee.
2. Upon publication, the paper, including plates, maps, diagrams and photographs reproduced, and all copyrights thereof, become the property of the Society.
3. Papers accepted for publication must be concise, conform to the style set, and be subject to the control of the Editor.
4. Manuscripts must be in double-spaced typescript on one side of the paper only.
5. Full plate size is 7 inches x 4½ inches. Text figures, maximum width, 4½ inches.
6. Generic and specific names must be underlined in the manuscripts and are printed in italics.
7. When possible, a proof will be supplied to the author for slight corrections. (Corrections deemed excessive by the Editor and Committee must be paid for by the author.)
8. Reprints are obtainable only by previous arrangement with the Editor and are charged to the author.

CONTENTS

Introduction. By Prof. R. Tucker Abbott, Ph.D. 1

Foreword. By Bernard C. Cotton, F.R.Z.S. 2

Some Opisthobranchia New to Australia or Otherwise of Interest.
By Joyce Allan, F.R.Z.S. 3

The Lightning Volute *Ericusa fulgetra* Sowerby.
By Bernard C. Cotton, F.R.Z.S. 8

On Some Opisthobranchia from Victoria. By Robert Burn 11

A New Species of the Volutidae from North Australia.
By Prof. J. M. Ostergaard & Ray Summers 30

Validity of the Genus *Exohaliotis*. By Robert R. Talmadge 32

Bothriembryon barretti Iredale Discards Its Epiphragm.
By Thelma Hartley 33

Existing Beds of the Bivalve *Anadara trapezia* Deshayes 1840 in
Westernport Bay, Vic. By R. J. Plant 34

A Species of *Ferussacia* in South Australia.
By Dr. L. A. W. C. Venmans, Ph.D. 36

Semicassis angasi Iredale from New South Wales. By Thelma Hartley..... 45

On Some Victorian Cephalopods. By Robert Burn 46

Intertidal Mollusca of Tasmania (Abstract).
By Ron C. Kershaw, Hon. Assoc. in Malacology, Queen Victoria
Museum, Launceston, Tasmania 47

Obituary 48

List of Members 49

Instructions to Authors 52

McKELLAR PRESS, MALVERN